THE GETTY COLLEGE OF

Arts and Sciences

David P. Peltier, Dean

Divisions and Departments
Fine Arts Art; Music; Communication Arts. Humanities English; Foreign Languages; Philosophy and Religion. Mathematical and Natural Sciences Biological Sciences; Chemistry; Mathematics and Computer Science; Physics. Social Sciences History; Political Science, and Public Administration; Psychology, Sociology, and Social Work. Teacher Education Education; Health, Physical Education, and Sports Studies; Industrial Technology.

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

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

The Bachelor of Arts Degree Program
General and Advanced Courses The General Education Program has been developed to provide the breadth of learning basics to a well-educated person. These courses furnish the foundation and background for advanced education. Work in the student's major is mostly taken on the advanced level, along with advanced electives.

General Education Requirements
The following are the prescribed general education courses required of all students enrolled in a Bachelor of Arts degree program.
A. Basic Requirements
1. Communication Skills
   English 110 and 111
   Speech 100
2. General Requirements
   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, 106, 107, or 108
Foreign Language: First-year competency (three courses in one language)

3. **Distributional Requirements**
Courses must be taken in each of the following divisions in addition to courses taken in (1) and (2):
   a. Fine Arts
      three courses (or equivalent totaling nine credit hours) in at least two disciplines: art, music, theatre
   b. Humanities
      one course not in discipline of primary major: English, foreign language, philosophy, religion
   c. Social Sciences
      two courses not in discipline of primary major: psychology, sociology, political science
   d. Natural Sciences/Mathematics-Computer Science
      five courses in at least three departments: biology, chemistry, physics, mathematics-computer science

B. 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 Third-World people, society, or culture
3. at least three 1-hour physical education activity courses.

**The Bachelor of Science Degree Program**
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, medical technology, chemistry, mathematics, industrial technology, or computer science.

A. Basic Requirements
1. **Communication Skills**
   a. English 110 and 111
   b. Speech 100

2. **Mathematical Skills**
two courses in mathematics (at the level of 120 or above) and two courses in mathematics or computer science (computer science 130 or above) with at least one course in computer science

3. One religion course (105, 106, 107, 108) and one course in philosophy (100 or 102)
B. General Requirements (outside the major program of study)
1. Science component (five courses)
   At least two courses in biology and two courses in chemistry or physics with one year's work in one of these disciplines
2. Arts/Humanities/Social Sciences (eight courses)
   a. English 204
   b. Western Civilization 110-111
   c. one course in social sciences
   d. one course in fine arts
3. three courses chosen from any combination of the following disciplines: art, music, theatre, English, foreign languages, philosophy, religion, history, political science, psychology, sociology, economics.

C. Graduation Requirements
A student's total educational program must include the following:
1. at least one course which involves substantial exposure to our study of a non-Western, Third-World people, society, or culture
2. at least three 1-hour physical education activity courses below the 100-level.

**Graduation Requirements—Non-Western, Third World Culture Courses**
The following courses will meet the general education graduation requirement in Non-Western, Third-World culture study:
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

**Completing a Major**
The degree candidate is required to complete in a logical sequence a major of not less than 45 quarter hours. The faculty advisor assists the student in planning his major by the third quarter of his sophomore year. Candidates for the degree of Bachelor of Arts who expect to teach in the public school are required to satisfy pro-
fessional education requirements and will have a member of the Department of Education for a professional adviser. 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>
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<tr>
<td>Ceramics</td>
<td>BFA</td>
</tr>
<tr>
<td>Graphic Design</td>
<td>BFA</td>
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<tr>
<td>Painting</td>
<td>BFA</td>
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<tr>
<td>Printmaking</td>
<td>BFA</td>
</tr>
<tr>
<td>Sculpture</td>
<td>BFA</td>
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<tr>
<td>Biochemistry</td>
<td>BS</td>
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<tr>
<td>Biology</td>
<td>BA, LaJ</td>
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<tr>
<td>Chemistry</td>
<td>BA, BS</td>
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<tr>
<td>College Student Personnel</td>
<td>BA</td>
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<tr>
<td>Communication Arts</td>
<td>BA</td>
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<tr>
<td>Speech</td>
<td>BA</td>
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<tr>
<td>Theatre</td>
<td>BA</td>
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<tr>
<td>Organizational Communication</td>
<td>BA</td>
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<tr>
<td>Public Relations</td>
<td>BA</td>
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<tr>
<td>Computer Science</td>
<td>BA, BS</td>
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<tr>
<td>Elementary Education</td>
<td>BA</td>
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<tr>
<td>English</td>
<td>BA</td>
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<tr>
<td>French</td>
<td>BA</td>
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<tr>
<td>Gerontology</td>
<td>BA</td>
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<tr>
<td>Health Education</td>
<td>BA</td>
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<tr>
<td>History</td>
<td>BA</td>
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<tr>
<td>Industrial Technology</td>
<td>BA, BS</td>
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<tr>
<td>International Studies</td>
<td>BA</td>
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<tr>
<td>Mathematics</td>
<td>BA, BS</td>
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<tr>
<td>Medical Technology</td>
<td>BSMT</td>
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<tr>
<td>Music</td>
<td>BA</td>
</tr>
<tr>
<td>Music Education</td>
<td>BM</td>
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<tr>
<td>Music Performance</td>
<td>BM</td>
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<tr>
<td>Philosophy</td>
<td>BA</td>
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<tr>
<td>Philosophy and Religion</td>
<td>BA</td>
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<tr>
<td>Physical Education</td>
<td>BA, BBA</td>
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<tr>
<td>Physics</td>
<td>BA, BS</td>
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<tr>
<td>Political Science</td>
<td>BA</td>
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<tr>
<td>Public Administration</td>
<td>BA</td>
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<tr>
<td>Psychology</td>
<td>BA</td>
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<tr>
<td>Religion</td>
<td>BA</td>
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<tr>
<td>Social Work</td>
<td>BA</td>
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<tr>
<td>Sociology</td>
<td>BA</td>
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<tr>
<td>Spanish</td>
<td>BA</td>
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<tr>
<td>Sports Management</td>
<td>BA</td>
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<tr>
<td>Sports Medicine</td>
<td>BA</td>
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<tr>
<td>Writing (second major only)</td>
<td>BA</td>
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**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 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.

**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. (See the Department of Education listing for details.)

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

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

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

Preprofessional Programs

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

Medical Technology Most students in medical technology study three years on campus and spend a fourth clinical year at an accredited Medical Technology School. Forty-five quarter hours are transferred from the medical technology school to Ohio Northern University and applied toward a B.S. in Medical Technology degree. Ohio Northern University is affiliated with St. Elizabeth’s Medical Center in Dayton and 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 Adviser, 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.

The chairman of the Department of Philosophy and Religion serves as adviser to the pretheological student in planning a preprofessional program, along with a departmental adviser in the major, if the student selects 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 College of Arts and Sciences, Engineering, Pharmacy, or Business Administration.

According to the Prelaw Handbook, students should select a major program of study which involves: (1) comprehension and expression in words, (2) critical understanding of the human institutions and values with which the law deals, and (3) creative power in thinking. Law schools seek entering students who have the capacity to think for themselves and the ability to express their thoughts with clarity and force. The prelaw student must work closely with his or her specific program adviser and with the Prelaw Advisory Committee to attain the goals of the program.

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

To qualify for guaranteed admission to the Ohio Northern University College of Law, undergraduate students must have a 3.30 GPA.
overall grade point average; transfer students must complete at least 75 credits at Ohio Northern with a grade point average of 3.30 or better in Ohio Northern courses in order to be automatically admitted to the Ohio Northern College of Law. Students must complete a prelaw declaration form and file it with their department/college prelaw adviser no later than when they have completed 120 quarter hours. At that time the students’ records will be reviewed by members of the Prelaw Advisory Committee, and they will be advised regarding how well they have met the intent of the program and how they should proceed to complete their courses of study. It will be the students’ responsibility to inform their advisers when they have 120 hours. Placement in law school depends, in large part, upon the academic record of the student plus the recommendations which that student receives from his/her academic adviser and the Prelaw Advisory Committee.

Combination Curricula

Four and Five Year Combination Curricula

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

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

Students taking a dual degree in the Colleges of Arts and Sciences and Pharmacy and Allied Health Sciences are required to meet the three-year residency requirement to qualify for graduation from the College of Pharmacy and Allied Health Sciences.

Dual degree students meet all requirements in each college in the same way as students graduating with one degree.

European Studies

A European Studies Minor is offered within the College of Arts and Sciences to enhance other major programs of study with in-depth study of some aspect of European language, culture, and history in close consultation with an adviser identified by the dean. A student must complete study in the following areas:

1. Language
   French, German, Spanish, or other continental European language beyond the elementary level. (8 credits)

2. Core Requirements
   History 221 - Contemporary Europe
   History 377-378 - History of Modern Europe I-II

3. Recommended cognate courses (15 credits)
   Study will be in a focused area of European studies identified by the student with an adviser.
   Suggested cognate courses:
   Art 305, 315, 325, 335
   French 219, 319, 327-328
   German 291, 337, 491
   Spanish 353, 447, 448, 452, 453
   History 324-325, 326, 327, 328, 329
   Political Science 334, 335, 421, 422, 455, 456-457
   Music 245, 321-322-323
   English 221-222-223
   Philosophy 331, 345, 348, 349, 350
   Religion 262, 346, 347, 353
   Theatre 241-242
   Education 401, 465
   Economics 385, 411, 443

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. A normal program consists of 12 to 19 scheduled hours including physical education.

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

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

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 chairman, any course pre-
requisite 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 option basis, with the following stipulations:
1. The student must be a full-time student in Arts and Sciences.
2. The student must have sophomore, junior, senior or post-graduate standing.
3. The requested course cannot be in the department of the student's major.
4. The requested course cannot be a 100-level general education course.
5. The requested course cannot be a cognate.
6. The grade of "S" is to be equated with A, B, C. The grade of "U" is equated with D or F.
7. Students cannot change their mind 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 his/her advisor, by the Vice President for Student Affairs, and 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.

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.

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

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

Graduation
To graduate with a Bachelor of Arts, a Bachelor of Fine Arts or a Bachelor of Science degree, a student is required to complete a minimum of 182 quarter hours which includes the 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 pre-clinical 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.

ARTS AND SCIENCES COURSES—GENERAL (Department 100)
Special topics courses may be offered by any department within the college.

000. ORIENTATION 1 hour Familiarization with college requirements, programs and academic services; exploration of academic and career goals; planning program of courses. Required of all students who have not declared a major.

121. CAREER PLANNING 1 hour 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 who are uncertain about their career plans.
Special topics courses may be offered by any department within the college with the approval of the dean.

190. SPECIAL TOPICS 1-3 hours
290. SPECIAL TOPICS 1-3 hours
390. SPECIAL TOPICS 1-3 hours
490. SPECIAL TOPICS 1-3 hours

MEDICAL SCIENCES

000. MEDICAL SCIENCES ORIENTATION
0 hours Familiarity with general requirements and admissions standards for entry into colleges of medicine, dentistry, veterinary medicine, etc. Open to students interested in preparing for a career in these areas.

ARMY ROTC

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 2 hours 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 hour 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 2 hours 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 2 hours This is an introductory course in military tactics. Topics include the Principles of War, Terrain Analysis, Fundamentals of offensive and defense 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
2 hours This course is a readings program into topics of classical and current military interest. Subjects that will be examined include: The emerging doctrine in military leadership, military organizations with an emphasis on stability and cohesion, and their impact on organizational effectiveness; 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.

301. PROFESSIONALISM/LEADERSHIP
4 hours Professionalism and leadership required of the US 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; or JROTC.

302. SMALL UNIT OPERATIONS 5 hours 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 hours Concepts and fundamentals of Army administration, supply and material readiness. Professional officer-ship 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 hours Organization and concepts of the US 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 hours 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 US Army Reserve Training Corps. This course is a requirement for commissioning. Instructor permission only.

AIR FORCE ROTC

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 I
1 hour Organization of the United States Air Force, mission function and employment of strategic forces, capabilities of Army in a limited war and counterinsurgency, Naval forces structure and employment, enemy threat assessment. Leadership laboratory activities.

112. AIR FORCE ORGANIZATION II
2 hours U.S. general purpose force capabilities, mission, resources, operation of tactical air forces, defensive forces, airlift forces, structure and function of logistics support weapons systems development. Leadership laboratory activities.

211. AIR FORCE HISTORY I
1 hour 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 II
2 hours 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 I
4 hours 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 II
5 hours 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.

371. FLIGHT INSTRUCTION PROGRAM: GROUND SCHOOL
4 hours Basic aerodynamics, aircraft systems and performance, flight instruments, medical facts, Federal Aviation Administration/National Transportation Safety Board regulations, National Airspace System, flight publications, meteorology and weather services. Aviation map and chart interpretation, flight computer, dead reckoning and piloting navigation, radio navigation, radio communication, airport operations, wake turbulence, flying safety. Required of AFROTC pilot candidates. Special departmental approval required for all others.

411. AIR FORCE OFFICERSHIP I
4 hours The Air Force officer as part of national security forces in contemporary American society, armed forces as an integral element of society. American civil military relations and environmental contact in which defense policy is formulated. Formulation and implementation of U.S. defense policy, framework of defense policy including domestic and international. Leadership laboratory activities. Prerequisite: Departmental approval.

412. AIR FORCE OFFICERSHIP II
2 hours The Air Force officer and his part in the evolution of defense strategy since World War II. Strategy and management of conflict, arms interaction and control, limited war, insurgency, counter-insurgency, international terrorism, military law Initial Active Duty Orientational Leadership laboratory activities. Prerequisite: Departmental approval.
The Departmental Courses

ART (Department 151)
Professors DeVore (Chairman), West, Associate Professor Chesser; Lecturer Greavu

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; 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: (1) Communication Skills (3 courses); Written Communication: English 110, 111 (taken in freshman year); Oral Communication: Speech 100; (2) 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; (3) Distributional Requirements (5 courses) (courses in each of the following divisions, in addition to courses taken in A.1 and A.2) (a) Fine Arts - two courses (or equivalent total-
000. ORIENTATION 1 hour Familiarization with the department, requirements for majors, planning program of courses, university catalog, and library. Required of all majors in the department.

100. ART 3 hours Analysis of the visual arts through selected works from the past and present. Illustrated lecture.

114. ART FOR ELEMENTARY TEACHERS 3 hours For 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 hours For the prospective elementary teacher with emphasis on teaching demonstrations, media, and methods in art, and the elements within. Illustrated lectures. Prerequisite: Art 114.

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

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

153. DRAWING III 3 hours 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 I 3 hours Introduction to and application of the elements and principles of plastic and graphic design. Required of all art majors.

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

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

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

222. GRAPHIC DESIGN I 3 hours Basic letter forms, emphasis on proportion, theory, rendering technique and applications of lettering in commercial art.

223. GRAPHIC DESIGN II 3 hours A continuation of 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. May repeat for a total of 6 hours.

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

251. PAINTING II 3 hours Techniques and modes of painting in oil. May repeat for credit to a total of 12 hours. Prerequisite: Art 250.

255. CERAMICS I 3 hours 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 3 hours An introduction to the design and rendering of sculptural form in a variety of media and techniques. Emphasis on organizational problems of form and space.

270. PRINTMAKING I 3 hours Methods and techniques of the Intaglio and Relief printmaking processes, including etching, woodcut, engraving, and linocut. May repeat for total of 12 hours. Prerequisites: Art 152, 162.

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

290. SPECIAL TOPICS IN ART 1-3 hours

305. ANCIENT AND MEDIEVAL ART 3 hours Art forms and styles from prehistoric times through the 14th century. Offered alternate years.

315. RENAISSANCE AND BAROQUE ART 3 hours The development of European Art and architecture from the 15th through the 18th century. Offered alternate years.

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

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

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

355. WATERCOLOR 3 hours Techniques and modes of painting in aqueous media. May repeat for credit to a total of 9 hours.
360. SCULPTURE II 3 hours The design and rendering of sculptural forms in a variety of media and techniques. May repeat to total of 9 hours. Prerequisite: Art 265.

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

410. ADVANCED CERAMICS 3 hours Directed study. May repeat to total credit of 12 hours. Prerequisite: 9 hours of Art 350.

415. ADVANCED PRINTMAKING 3 hours Directed study. May repeat to total credit of 12 hours. Prerequisite: 6 hours of Art 270.

420. ADVANCED PAINTING 3 hours Directed study. May repeat to total credit of 12 hours. Prerequisite: 6 hours of Art 250 and 251.

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

457. ART EDUCATION METHODS 3 hours Laboratory-seminar dealing with materials, techniques, and methods of secondary classroom instruction in art. Meets professional education requirement in methods area. Includes approximately 30 hours of field experience.

471. INTERNSHIP 15 hours Supervised field experience in an approved commercial art studio, agency, or design department; full time five days a week. Prerequisites: Senior rank; Art 222, 6 hours of Art 223, Industrial Tech 240 and 341; and permission of the department. Application for this course must be made through the student's advisor to the department chairman not later than one full quarter in advance of enrollment.

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

490. SPECIAL TOPICS IN ART 1-3 hours

494. SEMINAR IN ART 1-3 hours

497. INDEPENDENT STUDY IN ART 1-3 hours

BIOLOGICAL SCIENCES
(Department 121)

Professors Butler, Moore (Chairman), Nelson; Associate Professors Haagstrom, Keiser, Laing, Mayer; Assistant Instructor McGaw; Adjunct Faculty, St. Elizabeth Medical Center - Abramson, Martin; Riverside Hospital - Harding, Seccor.

Students majoring in the biological sciences will be exposed to a wide range of academic disciplines within biology, including current instrumentation and research techniques and written and oral scientific communication methods. Biology 100 is a principles course with a major emphasis on the study of the cell and genetics. It provides generalizations by which advanced courses in biology can be related to one another and is therefore a prerequisite to all other courses in the curriculum. Students desiring further knowledge of general biology may take Biology 112 which surveys microbial, plant and animal life, evolution and ecology, and Biology 113 which covers the anatomy and physiology of flowering plants and of the human. 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, pre-medicine, and preveterinary medicine, health technology, environmental testing, field biology, and secondary education. Core requirements for both degrees are Biology 100, 112, 113, 195, 295, 395, 495; one advanced systematic survey course such as Biology 204 or Biology 223; one advanced organismic course such as Biology 205, 300, 301, 231 or 331, or 351; one field biology course such as Biology 213, 251 with 252, 355, 383, 423; one course in Genetics 430 with 431. 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 204, 205, 213, 223, 231, 232, 233, 244, 251, 252, 290, 297, 300, 301, 321, 331, 332, 333, 343, 351, 355, 383, 423, 441, 451, 481, 490, 497. The independent study courses 297 and 497 and Internship 481 may count for only seven hours of these 16 biology elective hours.
Courses 361, 362, 372 and virology from the College of Pharmacy and Allied Health Sciences are accepted as electives. Credit cannot be granted for both 231 and 331 or 232 and 332 or 321 and Pharmacy 372. Both degrees require a minimum of 47 biology hours not counting Biology 195. 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. Biochemistry 341 and 342, taught in the College of Pharmacy and Allied Health Sciences and earth 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 and Allied Health Sciences, but are subject to the approval of the biological sciences faculty.

A student may minor in biology. A minimum of 30 quarter hours of biology is required. Required courses are the same as for a major in biology with the exception that 195, 295, 395, and 495 are not required. An additional two to three hours of biology electives are required to complete the requirement of 30 quarter hours of biology. Required cognate courses include 12 quarter hours in the Division of Mathematical and Natural Sciences, not including biology.

The Department of Biological Sciences offers a medical technology program leading to a Bachelor of Science in Medical Technology. Affiliate hospitals are St. Elizabeth Medical Center in Dayton, Ohio, and 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 100, 112, 113, 195, 223, 295, 301, 321, 331, 343, 430, 431, 495 plus 8 hours of advanced biology electives. Microbiology 362 offered in the College of Pharmacy and Allied Health Sciences is also required.

Courses in other areas of natural science include Chemistry 171, 172, 173, 231, 232, 233 and Biochemistry 341 offered in the College of Pharmacy and Allied Health Sciences, 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 St. Elizabeth Medical Center or 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 juniors and 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 management, laboratory research, cardiology, cardiovascular physiology, biomedical computer, hospital and technical health programs. Before embarking on an internship, students must complete at least two years of courses in biology and related areas. The internship must be approved by the faculty of the department.

100. GENERAL BIOLOGY (4+1) 4 hours
Biological principles and concepts of plant and animal life with emphasis on life at the cellular level and genetics. Laboratory material is made available and discussed when appropriate.
105. BIOLOGY FOR NON-MAJORS (3+1) 3 hours Biological concepts of plant and animal life with emphasis on classical biological principles and contemporary problems. Discussion in the presence of laboratory materials when appropriate. This is a terminal course which will not serve as a prerequisite for any other biology course and cannot be used as a basis for an in-depth sequence.

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

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

195. ORIENTATION (1+0) 1 hour Presentations and discussions relating to adjustments and requirements of academic life within the University, College and the Department of Biological Sciences.

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

205. ANGIOSPERM BOTANY (2+4) 4 hours Relationships within the flowering plant division including phylogeny and classification. The morphology, physiology, development and life cycles of the flowering plants. Prerequisites: Biology 112 and 113.

213. NATURAL HISTORY (1+6) 3 hours Recognition and identification of local biotic communities and their inhabitants. Field study emphasized. Prerequisites: Biology 112 and/or permission of the instructor.

223. INVERTEBRATE ZOOLOGY (3+3) 4 hours Invertebrate relationships including morphology, physiology, life cycles and taxonomy. Prerequisite: Biology 112.

231. ANATOMY AND PHYSIOLOGY I (4+2) 4 hours Basic principles of human structure and function, including relevant aspects of exercise physiology. Topics covered include cell physiology, metabolism, skin, bone and neural anatomy and physiology. Laboratory primarily covers the anatomy of the cat. Course may be taken out of sequence. Prerequisite: Biology 113.

232. ANATOMY AND PHYSIOLOGY II (4+2) 4 hours Continuation of 231. Topics covered include special senses, blood, immunology, renal system and digestive system, endocrinology and reproductive system. Laboratory presents relevant experiments on lecture topics. Prerequisites: Biology 113; 231 is not required, but recommended.

233. EXERCISE PHYSIOLOGY (4+2) 4 hours 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: Biology 231 or 232, both being highly recommended.

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

251. PRINCIPLES OF VERTEBRATE ECOLOGY (3+0) 3 hours Consideration of vertebrate populations, evolution, geography and of vertebrate roles in ecosystems and biotic communities. Prerequisites: Biology 112 and 113. Offered alternate years: 1987-88.

252. PRINCIPLES OF VERTEBRATE ECOLOGY LABORATORY (0+3) 1 hour Field work on populations and habitat distribution of vertebrates. Collected data is analyzed. Prerequisite or corequisite: Biology 251. Offered alternate years: 1987-88.

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

295. BIOLOGICAL LITERATURE RESEARCH 1 hour This course is designed to give the student experience in using the resources of the library for biological research. In addition, the student will read and critically analyze portions of classical and current papers and longer works that have had significant impact on the biological sciences.
297. INTRODUCTION TO BIOLOGICAL INVESTIGATIONS 1-3 hours Minor investigations for qualified freshmen and sophomores. Graded S-U.

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

301. DEVELOPMENTAL ANATOMY (2+4) 4 hours A study of the human embryonic and fetal development supplemented by laboratory studies of chick, pig and mouse embryonic development. Prerequisite: Biology 113.

321. IMMUNOLOGY (3+0) 3 hours Basic anatomical, physiological, and genetic principles of immunity with some reference to clinical application. Prerequisites: Biology 100, 113; one year of chemistry, with Biology 231 or 331 highly recommended.

331. PHYSIOLOGY I (3+3) 4 hours 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: Biology 113 and one year of chemistry. Corequisite: Chemistry 231.

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

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

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

351. CELL BIOLOGY (3+3) 4 hours Function and structure of cells. Bioenergetics, enzyme action, and subcellular entities (their structure, function, origin and development). Some consideration of interaction between cells. Prerequisites: Biology 112, 113; Chemistry 173. Offered alternate years: 1986-87.

355. INTRODUCTION TO MARINE BIOLOGY 4 hours The various marine environments and the organisms that inhabit them. A two-week field trip to a marine environment is required. May repeat for credit four times. Prerequisites: Biology 112 and/or permission of the instructor.

383. ANIMAL BEHAVIOR (ETHOLOGY) (2+2) 3 hours Basic principles of the behavior and ethology of invertebrates and vertebrates, stressing observational and descriptive techniques. Prerequisites: Biology 112, 113 and 223. Offered alternate years: 1986-87.

395. BIOLOGICAL RESEARCH 1 hour Working with a research adviser, the student 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.

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

424. VEGETATION OF THE GREAT SMOKY MOUNTAINS (1+2) 1 hour A three-day field study of the regional vegetation patterns in relation to altitude and topography. Prerequisites: Biology 100, 112, 113 and 213 or Biology 423. Corequisites: Either Biology 213 or 423. Biology 112, and 113 must be offered as a prerequisite if Biology 213 is offered as a corequisite. A special travel fee is assessed. Permission of the instructor. Offered alternate years: 1985-86.

425. VEGETATION OF THE SOUTHERN LAKE MICHIGAN REGION (1+2) 1 hour A three-day field study of regional vegetation patterns in relation to glacial and coastal lacustrine landforms. Emphasis on concepts of regional succession. Prerequisites: Either Biology 100, 112, 113 and 213 or Biology 423. Corequisites: Either Biology 213 or 423. Biology 100, 112 and 113 must be offered as a prerequisite if Biology 213 is offered as a corequisite. A special travel fee is assessed. Permission of the instructor. Offered alternate years: 1986-87.

430. GENETICS (3+0) 3 hours The principles of genetics as exemplified by microorganisms, higher plants and animals. Mendelian, biochemical, developmental and prokaryotic genetics are considered. Prerequisites: Biology 113, one year of Chemistry, and Math 142.
431. GENETICS LABORATORY (0+3) 1 hour Experiments which demonstrate genetic phenomena. Drosophila, bacteria, microscope slides and probability studies are employed. Corequisite: Biology 430

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

451. ADVANCED TOPICS IN CELL BIOLOGY (3+0) 3 hours A study of the current literature on selected topics in cell biology. No topic will be repeated in a four year period, so the course may be repeated for credit. Prerequisites: Biology 351 or Biochemistry 342. Offered alternate years: 1986-87.

481. INTERNSHIP PROGRAM 15 hours Juniors and seniors, with faculty approval, have the opportunity of gaining practical experiences in various areas such as wildlife management, forestry, zoology, environmental monitoring, cardiopulmonary technology, pro-health programs and other hospital specializations. Prerequisite: A minimum of 2 years work in the fundamentals of Biology and related areas.

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

495. SEMINAR IN BIOLOGY 1 hour

497. INDEPENDENT STUDY IN BIOLOGY 1-3 hours Graded S-U.

MEDICAL TECHNOLOGY

460. ORIENTATION TO MEDICAL TECHNOLOGY 2 hours An introduction to basic laboratory instruments, methods, procedures, terminology, ethics and safety.

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

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

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

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

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

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

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

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

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

470. CLINICAL HEMATOLOGY/COAGULATION LABORATORY 4 hours Laboratory instrumentation and procedures to correlate with the lectures.

471. CLINICAL CHEMISTRY LECTURE 8 hours 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 hours Laboratory instrumentation and procedures to correlate with the lectures.

473. URINALYSIS LECTURE 1 hour Physiology of urinary system, related diseases and correlation to disease states.

474. URINALYSIS LABORATORY 1 hour Laboratory methods and instrumentation to correlate with lectures.

475. LABORATORY MANAGEMENT LECTURE P/F 0 hours Theory and discussion of supervision and management.
476. CLINICAL PATHOLOGY 1 hour
Correlation of clinical laboratory findings with different human physiological states. Consists of case studies, review sessions, management and education orientation. Prerequisite: Completion of the pre-professional medical technology curriculum for students at St. Elizabeth Medical Center. Enrollment limited to medical technology interns.

477. CLINICAL PATHOLOGY SEMINAR 1 hour
Consists of presentation and discussion of special topics and current developments in clinical laboratory medicine. Topics are presented by students and guest lecturers. Prerequisite: Completion of the pre-professional medical technology curriculum for students at St. Elizabeth Medical Center. Enrollment limited to medical technology interns.

CHEMISTRY (Department 122)

Professors Haight, Hawbecker (Chairman), Kurtz, Wilhelm; Associate Professors Lamb, Sadurski; Assistant Professors Divis, J. Hruschka, Renkes.

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

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

Major in Chemistry 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 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, 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 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. Interested students should especially note that additional courses in biochemistry are available in the College of Pharmacy and Allied Health Sciences.

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 second major will usually 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 own program within the following framework: chemistry 000, 181-182-183, 241-242-243, 494, plus three courses from among 304, 311, 324, 337, 351, and a minimum of 12 credit hours in 300-400 level courses in the Division of Mathematical and
Natural Sciences or other 300-400 level courses acceptable to the department. 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 324 and either 337 or 351. 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 100-112-113; 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 Biochemistry Major. Students wishing to major in biochemistry should contact the Department Chairman.

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

000. ORIENTATION (1+0) 1 hour 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 hours Orientation to and understanding of the fundamental nature of chemistry; models and measurements. Chemistry 171 recommended for science majors. Credit may be received for either Chemistry 100 or 171, but not for both.

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

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

162. CHEMISTRY-CONCEPTS AND APPLICATIONS 1 (4+3) 5 hours A survey of fundamental concepts of chemistry. Basic chemical theories are introduced and applied to practical situations. The laboratory is designed to reinforce the lecture program. Prerequisite: Mathematics 261 and Physics 231-2-3 with related laboratory, or the equivalent, or permission of the Chairman.

163. CHEMISTRY-CONCEPTS AND APPLICATIONS 2 (3+0) 3 hours Chemical properties of the elements and the application of those properties to such problems as synthesis, analysis, industrial processes and environmental quality. Prerequisite: Chemistry 162.

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

169. BASICS OF CHEMISTRY LABORATORY (0+2) 1 hour Recommended as a complement to Chemistry 168. Emphasizes basic skills and techniques. Course graded S-U.

171. INTRODUCTORY CHEMISTRY 1 (4+3) 5 hours Fundamental principles of chemistry in terms of the atomic theory and its application to compound formation, bonding, structure, acid-base and oxidation-reduction reaction chemistry. The laboratory relates physical observations to the principles presented in lecture. Credit may be received for either Chemistry 100 or 171, but not for both. High school chemistry or the equivalent is required.

172. INTRODUCTORY CHEMISTRY 2 (4+3) 5 hours 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: Chemistry 171.

173. INTRODUCTORY CHEMISTRY 3 (4+3) 5 hours Qualitative and quantitative aspects of chemical reactivity including general and ionic equilibrium, electrochemistry, descriptive inorganic reaction chemistry and nuclear chemistry. The laboratory illustrates
181. INTRODUCTORY CHEMISTRY FOR MAJORS 1 (4+3) 5 hours The same lecture and laboratory as Chemistry 171.

182. INTRODUCTORY CHEMISTRY FOR MAJORS 2 (4+3) 5 hours The same lecture and laboratory as Chemistry 172.

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

231. ORGANIC CHEMISTRY 1 (3+3) 4 hours Applications of the concepts of bonding, structure, synthesis and mechanisms to the chemistry of organic compounds. Emphasis is on bonding, nomenclature, structural isomerism and the chemistry of alkanes, alkenes and alkyl halides, including addition polymerization. Laboratory emphasizes special techniques including chromatography and synthetic procedures pertaining to substitution and elimination reactions. Prerequisite: Chemistry 173 or 183.

232. ORGANIC CHEMISTRY 2 (3+3) 4 hours Stereochemistry, spectrometry, and the chemistry of alkynes, dienes, aromatic compounds and organometallic compounds. Laboratory features organic synthesis and structural determinations which illustrate the concepts from the lecture. Prerequisite: Chemistry 231 or 241.

233. ORGANIC CHEMISTRY 3 (3+3) 4 hours Functional behavior of organic oxygen and nitrogen compounds, lipids, carbohydrates, amino acids and proteins, including condensation polymerization. Laboratory features multi-step synthesis and qualitative organic analysis. Prerequisite: Chemistry 232 or 242.

241. ORGANIC CHEMISTRY 1 - MAJORS (3+3) 4 hours The same lecture and laboratory as Chemistry 231. Prerequisite: Chemistry 173 or 183.

242. ORGANIC CHEMISTRY 2 - MAJORS (3+3) 4 hours The same lecture and laboratory as Chemistry 232. Prerequisite: Chemistry 231 or 241.

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

290. SPECIAL TOPICS IN CHEMISTRY 1-3 hours

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

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

311. CHEMISTRY OF BIOLOGICAL MOLECULES (4+0) 4 hours 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 mechanism, isolation and characterization techniques, and an introduction to the design and regulation of metabolic pathways. Prerequisites: Chemistry 233 or 243 and Mathematics 262.

324. INTERMEDIATE INORGANIC CHEMISTRY (3+3) 4 hours Preparation, properties and reactions of main group and transition metal elements and their compounds. Laboratory involves the application of fundamental techniques to the synthesis of these compounds and the systematic study of their reactions and properties. Prerequisites: Chemistry 233 or 243 or approval of chairman.

337. ELEMENTS OF PHYSICAL CHEMISTRY (4+0) 4 hours A survey of fundamental principles of physical chemistry including classical thermodynamics, gaseous state, liquid state, macromolecules, quantum theory and spectroscopy. Applications to biological systems are emphasized. Prerequisite: Chemistry 232 or 242; three courses from Department of Mathematics and Computer Science. Offered in alternate years.

341. PHYSICAL CHEMISTRY 1 (3+3) 4 hours Classical thermodynamics. Laboratory illustrates principles and exemplifies applications. A knowledge of computer programming is recommended. Prerequisites: Chemistry 233 or 243; Physics 231, 232, 233, with related laboratories; and Mathematics 262 and 272.
342. PHYSICAL CHEMISTRY 2 (3+3)  
4 hours Quantum mechanics. Laboratory illustrates applications in spectroscopy. A knowledge of elementary differential equations is recommended. Prerequisite: Chemistry 341.

343. PHYSICAL CHEMISTRY 3 (3+3)  
4 hours Statistical thermodynamics, elementary crystal structure and chemical kinetics. Laboratory illustrates principles and applications. Prerequisite: Chemistry 342.

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

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

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

462. ADVANCED ANALYTICAL CHEMISTRY (3+3) 4 hours Theoretical-experimental study of modern methods of instrumental analysis. The physico-chemical principles as well as the design and use of chemical instrumentation. Laboratory stresses independent, investigative experimentation. Prerequisite: Chemistry 351 and 343 or approval of department chairman.

473. ADVANCED TOPICS IN PHYSICAL CHEMISTRY (3+0) 3 hours A theoretical study of selected topics in chemical physics. Use of current literature is emphasized. A knowledge of computer programming is recommended. Prerequisite: Chemistry 343.

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

481. SENIOR RESEARCH 1 2 hours Prerequisite: Approval of the department chairman.

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

483. SENIOR RESEARCH 3 2 hours Prerequisite: Approval of the department chairman.

490. SPECIAL TOPICS IN CHEMISTRY 1-3 hours

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

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

BIOCHEMISTRY 4 hours See course description for Biochemistry 341-342 under the Department of Pharmacology and Biomedical Sciences in the College of Pharmacy and Allied Health Sciences.

COMMUNICATION ARTS (Department 153)

Associate Professor Roberts; Assistant Professors Bayliss, Johnson (Acting Department Chairman), Riess (Sabbatical Chairman), Instructors Klein (leave), Heck, Lawlor, S. Moore.

The Department of Communication Arts is committed to both a strong liberal arts education and a flexible professional program adapted to individual needs and interests. 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. The student majoring in the Communication Arts builds upon these core courses in pursuing a concentration particular to his professional and
educational goals. Concentrations are offered in the following areas:

- Speech
- Theatre
- Public Relations
- Organizational Communication

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. Those concentrations can be specified as majors, minors, or a combination. Beyond the traditional classroom learning situation the department offers and encourages active involvement in speech, theatre, and broadcasting activities. Participation in Individual Events and Debate is open to all university students. Individual Events encompasses all individual speaking opportunities such as persuasive, informative, sales, impromptu, extemporaneous, and oral interpretation of all forms of literature. Debate encompasses formal debate on national topics as well as off-topic debating. Participation in theatre productions is also open to all university students. Students may participate in the University Theatre, the Theatre of YOUTH (a touring children's theatre company), and in the Studio Theatre (student mounted laboratory productions). All Communication Arts activities often include local, state, and national competition. In addition, Radio Station WONU provides practical experiences for those students interested in broadcasting and management.

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 Public Relations (CA 130)
Theatre History I (CA 291)
Introduction to Broadcasting (CA 150)
Public Speaking (CA 211)

**Communication Arts with Speech Concentration** (45 hours)

I. Communication Arts Core Requirements (12 hours)
II. Concentration Requirements: Speech (12 hours)
Persuasive Speaking (CA 311)
Business and Professional Speaking (CA 315)
Group Communication (CA 321)
Communication Theory (CA 230)

III. Speech Concentration Electives (Departmental) (21 hours)

Choose three
Argumentation (CA 121)
Interpersonal Communication (CA 225)
Interviewing (CA 221)
Oral Interpretation (CA 160)
Organizational Communication (CA 421)

Choose three
Individual Events Act. (3 hours minimum) (CA 201)
Debate (3 hours minimum) (CA 202)
Voice and Diction (CA 340)
Parliamentary Procedure (CA 240)
Independent Study (3 hours minimum) (CA 499)

Choose one
Readers Theatre (CA 361)
Radio Theory and Operations (CA 251)
Acting (CA 260)
Theatre Criticism (CA 492)

IV. Speech Cognates
Although none are required, the student should select electives in close consultation with an advisor.

**Communication Arts with Theatre Concentration** (45 hours)

I. Communication Arts Core Requirements (12 hours)

II. Concentration Requirements: Theatre (12 hours)
Acting (CA 260)
Creative Drama (CA 351)
Production Analysis (CA 385)
Theatre Technology (CA 275)

III. Theatre Concentration Electives (Departmental) (21 hours)

Choose three
Oral Interpretation (CA 160)
Text Study (CA 460)
Makeup (CA 278)
Theatre History II (CA 292)
Theatre Criticism (CA 492)
Art Management (CA 480)
Children's Theatre (CA 352)
Readers Theatre (CA 361)
Cinema (CA 390)
Choose two
Directing (CA 386)
Scene Design (CA 375)
Lighting Design (CA 376)
Costume Design (CA 377)
Stage Management (CA 285)
Children's Theatre Tour (CA 353)

Choose two
Performance Practicum (CA 261)
Production Practicum (CA 276)
Directing Practicum (CA 387)
Design Practicum (CA 378)

IV. Theatre Cognates
Although none are required, the student should select electives in close consultation with an advisor.

Communication Arts with Public Relations Concentration (85-87 hours)

I. Communication Arts Core Requirements (12 hours)
II. Concentration Requirements: Public Relations Core (11 hours)
Publicity, Media & Campaigns (CA 330)
Public Relations Case Problems (CA 430)
Internship (5 hours minimum) (CA 335)

III. Public Relations Concentration Electives (Departmental) (18 hours)
Choose three
Organizational Communication (CA 421)
Group Communication (CA 321)
Parliamentary Procedure (CA 240)
Interpersonal Communication (CA 225)

Choose two
Argumentation (CA 121)
Business & Professional Speaking (CA 315)
Persuasive Speaking (CA 311)

Choose one
Communication Theory (CA 230)
Radio Theory and Operations (CA 251)
Acting (CA 260)

IV. Public Relations Cognates (36 hours)
English: choose four
Newswriting I (English 241)
Magazine Writing (English 243)
Journalism Layout & Design (English 246)
Factual Writing (English 343)
Writing from Evidence (English 344)
History of Literary Criticism (English 381)
Social Sciences: choose three
Principles of Behavioral Analysis (Psychology 212)
Social Psychology (Psychology 301)
Organizational Psychology (Psychology 316)
Cultural Anthropology (Psychology 250)
Business Administration: choose four
Business Law I (BA 322)
Marketing (BA 351)
Salesmanship (BA 371)
Advertising (BA 372)
Human Relations in Business (BA 365)
Business and Society (BA 410)

Graphic Skills: choose two
Design I (Art 161)
Graphic Design (Art 222)
Intro to Gr. Comm. (IT 240)
Photography (IT 341)
Statistics/Computer Science: choose two
Prob. & Stat. I (Math 142)
Intro to Info. Proc. (CS 130)
FORTRAN Pgmg. (CS 230)
Prob. & Stat. II (Math 143)
Intro to Pgmg. (CS 134)
Intro to COBOL (CS 231)

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

Communication Arts with Organizational Communication Concentration (50 hours)

I. Communication Arts Core Requirements (12 hours)
II. Concentration Requirements: Organizational Communication Core (12 hours)
Organizational Communication (CA 421)
Interviewing (CA 221)
Group Communication (CA 321)
Interpersonal Communication (CA 225)

III. Organizational Communication Concentration Electives (Departmental) (8 hours)
Choose one
Business & Prof. Speaking (CA 315)
Communication Theory (CA 230)

Choose one
Parliamentary Procedure (CA 240)
Argumentation (CA 121)

Choose one
Voice and Diction (CA 340)
Internship (CA 335)

IV. Organizational Communication Cognates (15 hours)
Social Psychology (Psychology 301)

Choose one
Writing from Evidence (English 344)
Factual Writing (English 343)
Journalism Layout and Design (English 346)
Choose two
Principles of Management (BA 330)
Personnel Management (BA 363)
Human Relations in Business (BA 365)
Business & Society (BA 410)
Business Communications (BA 391)

Choose one
Organizational Psychology (Psychology 315)
Organizational Behavior (Sociology 245)

**Communication Arts (without concentration)** (48 hours)

1. **Communication Arts Core Requirements** (12 hours)
2. **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)

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

4. **Cognates** (3 hours)
   - One advanced writing course (English Department)

**Minors** A minor in any concentration area of Communication Arts is satisfied by completing both the Communication Arts Core Requirements (I) and Concentration Requirements (II) and additional hours to be selected from Concentration Electives and any cognate areas to constitute a minimum of 30 course hours. Cognate courses may be selected from areas/disciplines other than those listed for each concentration, but must be approved by the department.

**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 chairman 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:

- 500-131 Principles of Accounting I
- 500-132 Principles of Accounting II
- 500-133 Principles of Accounting III
- 500-362 Managerial Finance
- 500-351 Marketing
- 500-322 Business Law I
- 500-363 Principles of Management
- 500-330 Personnel Management
- 500-202 Principles of Microeconomics
- 500-371 Salesmanship

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**000. ORIENTATION** 1 hour 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 hours 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 Communication Skills Center are available to the student.

**105. THEATRE** 3 hours General survey of the theatrical art form utilizing the screening of popular films. Emphasis includes acting, directing, and design.

**121. ARGUMENTATION** 3 hours (Formerly 110). Basic argumentative speaking and debate; proposition analysis; use of evidence, elementary logic, and case construction. Emphasis on simulated activities, such as in-class debates.

**130. INTRODUCTION TO PUBLIC RELATIONS** 3 hours Primarily a theory course describing the role, function, and responsibilities of the public relations practitioner within organizations.

**150. INTRODUCTION TO BROADCASTING** 3 hours (Formerly 120). A brief historical survey of the evolution of broadcasting, along with examination of contemporary practices in announcing, programming, scheduling, traffic etc. Laboratory hours arranged.
160. ORAL INTERPRETATION 3 hours (Formerly 262). Analysis and oral interpretation of the logical, emotional and aesthetic experience in poetry, prose, and dramatic dialogue, with emphasis on individual preparation and performance.

201. SPEECH TEAM: INDIVIDUAL EVENTS 1-3 hours (Formerly 270). 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 PRACTICUM 1-3 hours (Formerly 271). Extra-curricular debate activities. May be repeated for graduation credit by non-majors up to a maximum of 6 hours. Graded S-U.

211. PUBLIC SPEAKING 3 hours (Formerly 272). Extensive application of basic principles of oral communication in the composition and delivery of original speeches. Prerequisite: CA 100.

221. INTERVIEWING 3 hours (Formerly 235). Examination of the basic principles and techniques of interviewing and their applications to informational, employment, and persuasive/counseling situations. In-class and out-of-class experiences in actual interviewing provide emphasis.

225. INTERPERSONAL COMMUNICATION 3 hours (Formerly 210). Analysis of dimensions and relationships in interpersonal communication: especially needs, perceptions, orientations, contexts, and barriers. Course is oriented toward exercises, demonstrations, and applications to student's own experience with basis upon transactional analysis.

230. COMMUNICATION THEORY 3 hours The course is designed to provide a framework of foundational knowledge about the theories, nature, and dynamics of human communication/interaction. Prerequisite: CA 100.

240. PARLIAMENTARY PROCEDURE 3 hours (Formerly 360). Methods of conducting formal meetings by parliamentary rules.

251. RADIO THEORY AND OPERATION 3 hours (Formerly 125). To acquaint students with operational procedures of commercial radio stations. Participation in radio performance, production, and writing techniques. Practice in performance skills offered via required labs and provided through production facilities at WONU Radio.

252. BROADCASTING ACTIVITIES 1-3 hours (Formerly 220). Broadcasting practicum involving, but not limited to, announcing, traffic, management, scheduling, programming, writing, etc. May be repeated for graduation credit by non-majors up to a maximum of six hours. Graded S-U.

260. ACTING 3 hours (Formerly 282 and 283). A studio class designed to introduce and develop fundamental acting skills through readings, discussions, exercises, monologues, and scenes. Students are coached both privately and during the class by the instructor. Course may be repeated for a maximum of six hours by non-majors for graduation credit and for a maximum of nine hours by majors for graduation credit.

261. PERFORMANCE PRACTICUM 1-3 hours (Formerly 250). Open only to those students who have auditioned for and have been awarded roles in major University Theatre or Studio Theatre productions. May be repeated by non-majors for graduation credit up to a maximum of 6 hours. Prerequisite: Permission of director. S-U grading.

275. THEATRE TECHNOLOGY 3 hours Introduction to theoretical and practical work in the fundamentals of technical theatre production. Content includes scenic construction, property construction, theatrical sound, basic drafting, basic design theory. Required lab work.

276. PRODUCTION PRACTICUM 1-3 hours (Formerly 280). Participation in technical/production aspects of University and/or Studio Theatre productions. A maximum of six hours may be taken by non-majors for graduation credit.

278. MAKEUP 3 hours (Formerly 311). 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 hours A study of the principles and practices of stage management and logistical organization of the commercial and noncommercial theatre. Content includes scheduling, pre-production planning, auditions, rehearsals, performance procedures, budgeting, and company organization and structure.
291. THEATRE HISTORY 1 3 hours (Formerly 241). History and social impact of the theatre from ancient times to 1800.

292. THEATRE HISTORY 2 3 hours (Formerly 242). History and social impact of the theatre from 1800 to the present.

311. PERSUASIVE SPEAKING 3 hours (Formerly 373). Understanding and applying techniques of persuasion through audience analysis, preparation and delivery of speeches, and utilization of persuasive theories in both practice and composition.

315. BUSINESS AND PROFESSIONAL SPEAKING 3 hours 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: CA 100.

321. GROUP COMMUNICATION 3 hours (Formerly 371). The process of group discussion and problem-solving techniques; opportunities to participate in and lead discussion. Prerequisite: CA 100.

330. PUBLICITY, MEDIA, AND CAMPAIGNS 3 hours Primarily a theory 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: CA 130.

335. INTERNSHIP 1-15 hours (Formerly 410). Primarily a skills course designed to blend classroom theory with practical experience via internships or externships with organizations. Consultation with, and approval of, instructor. Variable credit course, maximum of 15 hours counting toward graduation for the major, and a maximum of 5 for the minor.

340. VOICE AND DICTION 3 hours (Formerly 254). 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.

350. SPEECH/THEATRE METHODS 3 hours (Formerly 370). 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.

351. CREATIVE DRAMA 3 hours Methods and practice of incorporating theatre into educational, community, religious, and recreational activities for children and youth of all ages.

352. CHILDREN'S THEATRE 3 hours Study of script analysis, directing, acting, and designing as they relate to children's development stages. Rehearsal and/or construction of ONU Theatre for Youth spring tour. May be repeated for a total of 6 credit hours. Prerequisite: Permission of director.

353. CHILDREN'S THEATRE TOUR 3 hours Tour and performance by ONU Theatre for Youth. Possible field experience credit for education majors. May be repeated for a total of 6 hours. Prerequisite: Permission of director.

361. READERS THEATRE 3 hours (Formerly 365). Group performance in the dramatic interpretation of the novel, short story, drama, and poetic forms; lab rehearsals for University performance.

375. SCENE DESIGN 3 hours (Formerly 441). Methods and practice in the art of scenography; application via University Theatre, Children's Theatre, and/or Studio Theatre productions.

376. LIGHTING DESIGN 3 hours (Formerly 442). Methods and practice in the art of lighting design; application via University Theatre, Children's Theatre, and/or Studio Theatre productions.

377. COSTUME DESIGN 3 hours (Formerly 443). Methods and practice in costume design and construction; application via University Theatre, Children's Theatre, and/or Studio Theatre productions.

378. DESIGN PRACTICUM 3 hours The actual design, supervision, and execution of lights, set, 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: CA 375, 376 or 377 and/or permission of the department.

385. PRODUCTION ANALYSIS 3 hours 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 hours Methods, theories, exercises, and practices in directorial concepts; production of scenes in Studio Theatre. Prerequisite: 3 hours of acting or permission of the instructor.

387. DIRECTING PRACTICUM 3 hours 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: CA 386 and permission of the instructor.

390. CINEMA 3 hours An examination of the development of the contemporary cinema. Attention is focused on influential directors and producers, major critics, and the business of marketing and selling a film. Prerequisite: CA 105.

421. ORGANIZATIONAL COMMUNICATION 5 hours (Formerly 380). Functions, forms and patterns of communication in organizations. Effects of organizational structures and dynamics on communication. Methods of evaluating communication policies and practices as an aid to organizational management. A survey course designed to introduce students to the nature of organizational communication, its problems and techniques for improvement. Emphasis on internal communication audit. Lab hours arranged.

430. PUBLIC RELATIONS CASE PROBLEMS 3 hours An examination of public relations case studies concerning problems in industry, business, education, government, social welfare and trade associations. Prerequisite: CA 130.

460. TEXT STUDY 3 hours The course explores the techniques for studying dramatic literature by the actor to make the work accessible for performance. Content includes dramatic structure, given circumstances, previous action, dialogue characteristics, beats and units, characterization, meaning, and mood. Prerequisite: CA 260 or permission of instructor.

480. ARTS MANAGEMENT 3 hours Explores the management of commercial and non-commercial arts organizations. Content includes philosophy, finances, operations, and promotion.

490. SPECIAL TOPICS IN COMMUNICATION ARTS 1-3 hours

492. THEATRE CRITICISM 3 hours A survey of the changing role of theatre criticism from the classic Greek to contemporary periods. Prerequisites: CA 291 or 292.

499. INDEPENDENT STUDY IN COMMUNICATION ARTS 1-3 hours (Formerly 497). Prerequisite: Permission of department.

EDUCATION (Department 141)

Professors Miller, Traxler (Chairman); Associate Professors Crider, Haynes, Perry; Professor Emeritus Rubeck (part-time); Lecturers Heath, King, Stumpff, Taylor, Wirt.

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

A Provisional Certificate valid for four years is issued by the State of Ohio to students who earn the baccalaureate degree, including at least 58 credit hours in professional education for elementary education certification, 45 credit hours in professional education for secondary education certification, or 49 credit hours in professional education for all grades (K-12) certification; and are recommended by the University as having desirable personal qualities.

Students in the program of Teacher Education (elementary, secondary, all-grades) are required to participate in a minimum of 300 hours of supervised field/clinical experience before student teaching. These experiences are included in the required education courses. (Additional information about clinical and field experiences is available in the department of education and from the professional education advisors.)

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

1. Successfully completed 90 quarter hours.
2. A minimum overall accumulative grade point average of 2.00.
3. A minimum combined accumulative grade point average of 2.25 in the major field and professional education courses.
with no grade less than “C”.
4. Completed the following courses with no grade less than “C”: Elementary: Education 100, 150 or 151, 223, 281; English 110, 111; Speech 100; Psychology 100.
All Grades (K-12): Education 100, 111, 150 or 151, 223, 224; English 110, 111; Speech 100; Psychology 100.
Secondary: Education 100, 111, 150 or 151, 224; English 110, 111, Speech 100; Psychology 100.
5. Favorable recommendations from the following: departmental faculty advisor, major department chairperson, course instructor of Child or Adolescent Psychology (both if seeking All-Grades certification, K-12), faculty member from the major department or Education Department, any other faculty member, and Residence Life.

ELEMENTARY EDUCATION
Requirements for certification in the various elementary education areas may be obtained from the Office of the Director of Teacher Education.
Professional education requirements are:
Education 100 education 3 hours
Education 150 urban school five-day experience 1 hour
Education 151 suburban or rural school five-day experience 1 hour
Education 223 child psychology 4 hours
Education 250 instructional media 3 hours
Education 260 or sociology 105 or 203 3 hours
Education 281 teaching in the elementary school 4 hours
Education 308 teaching mathematics 4 hours
Education 309 teaching science 4 hours
Education 310 children’s literature 4 hours
Education 311 teaching social studies 4 hours
Education 312 teaching reading I 4 hours
Education 314 teaching reading II 4 hours
Education 470.02 student teaching 15 hours
TOTAL 58 hours

Dual—Elementary with LD/BD (Learning and/or Behavior Disorders)
Education 210 introduction to special education 3 hours
Education 315 education of children with learning disabilities 4 hours
Education 360 evaluation and measurement of learner progress 3 hours
Education 365 classroom management of the exceptional learner 4 hours
Education 420 methods of teaching learning disabled children and youth 3 hours
Education 421 assessment and evaluation of exceptional learners 3 hours
Education 422 student teaching in learning disabilities 9 hours

Following course is strongly recommended: Education 224 Adolescent Psychology 4 hours.

Elementary Education with Kindergarten-Primary certification. Completion of elementary education program plus education 329, 330, 331 9 hours.

Elementary Education with validations in:
Art, visual for elementary grades
Data Processing
Driver Education
French for elementary grades
Music for elementary grades
Physical Education for elementary grades
Reading
Spanish for elementary grades
See the Director of Teacher Education for specific program.

Dual—Elementary Education with Teaching Field in Secondary Education. See Director of Teacher Education for specific program.

SECONDARY EDUCATION
Requirements for certification in the various secondary teaching fields may be obtained from the Office of the Director of Teacher Education.
Professional education requirements are:
Psychology 100 psychology 4 hours
Education 100 education 3 hours
Education 111 secondary/all grades field experience 1 hour
Education 150 urban school five-day experience 1 hour
Education 151 suburban or rural school five-day experience 1 hour
Education 224 adolescent psychology 4 hours
Education 250 instructional media in education (3 hours) or Education 251 instructional media lab (1 hour) 1-3 hours
Education 342 reading in the content area 4 hours
Education 370 social issues in the secondary schools 4 hours
Education 380 secondary curriculum 4 hours
Methods course(s) in certification area from the following: 3-4 hours
Education 450 (4 hours)
Art 456 (3 hours)
Health 350 (3 hours)
Industrial Technology 473 (3 hours)
Music 462 (3 hours)
Physical Education 351 (3 hours)
Speech 370 (3 hours)
Education 480.02—student teaching 15 hours
TOTAL 45-48 hours

Secondary Certification programs are offered in the following areas:
Art, Visual
Biological Science
Bookkeeping-Basic Business
Chemistry
Data Processing (Validation)
Driver Education (Validation)
Economics
English
General Science
Health
History
Industrial Arts
Languages: French, Spanish
Mathematics
Music
Physical Education
Physics
Political Science
Reading
Sales-Communication
Social Psychology
Social Studies Comprehensive
Sociology
Speech

Dual—Secondary with LD/BD (learning and/or Behavior Disorders)
Education 210 introduction to special education 3 hours
Education 315 education of children with learning disabilities 4 hours
Education 360 evaluation and measurement of learner progress 3 hours
Education 365 classroom management of the exceptional learner 4 hours
Education 420 methods of teaching learning disabled children and youth 3 hours
Education 421 assessment and evaluation of exceptional learners 3 hours
Education 421 assessment and evaluation of exceptional learners 3 hours
Education 422 student teaching in learning disabilities 9 hours

The following courses are strongly recommended:
Education 223 child psychology 4 hours
Education 308 teaching mathematics in the elementary school 4 hours
Education 312 teaching reading 1 4 hours
Education 314 teaching reading 2 4 hours

ALL GRADES (K-12) CERTIFICATION
Requirements for certification in the various all grades (K-12) areas may be obtained from the Office of the Director of Teacher Education.

Professional education requirements are:
Education 100 education 3 hours
Psychology 100 psychology 4 hours
Education 111 secondary/all grades field experience 1 hour
Education 150 urban school five-day experience 1 hour
Education 151 suburban or rural school five-day experience 1 hour
Education 223 child psychology 4 hours
Education 224 adolescent psychology 4 hours
Education 250 instructional media in education (3 hours) or Education 251—
instructional media lab (1 hour) 1-3 hours
Education 342 reading in the content area 4 hours
Education 370 social issues in the secondary schools 4 hours
Education 380 secondary curriculum 4 hours

Methods course(s) in certification area from the following: (3-6 hours)
Education 450 (4 hours)
Art 457 (3 hours)
Health 350 (3 hours)
Industrial Technology 473 (3 hours)
Music 461 and 462 (3 hours each)
Physical Education 351 (3 hours)
Education 470.01-480.01—student teaching 15 hours
TOTAL 49-54 hours

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

All Grades (K-12) Certification with validation in:
Data Processing
Driver Education
Reading
**Dual—All Grades (K-12) with LD/BD**
(Learning and/or Behavior Disabilities)
Education 210 introduction to special education 3 hours
Education 315 education of children with learning disabilities 4 hours
Education 360 evaluation and measurement of learner progress 3 hours
Education 365 classroom management of the exceptional learner 4 hours
Education 420 methods of teaching learning disabled children and youth 3 hours
Education 421 assessment and evaluation of exceptional learners 3 hours
Education 422 student teaching in learning disabilities 9 hours
The following courses are strongly recommended:
Education 308 teaching mathematics in the elementary school 4 hours
Education 312 teaching reading 1 4 hours
Education 314 teaching reading 2 4 hours

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

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

A major in college student personnel consists of the following requirements:
Biology 113, 231
Education 224, 366, 425, 426, 463, 487
(9-15 hours of internships/practicum)
Mathematics 142
Psychology 100, 111, 210, 212, 215, 301, 311, 411, 420, 424
Sociology 105, 240, 243, 246
Speech 321
To complete the major in psychology, the student also needs:
Psychology 211 and nine hours of psychology electives.

**100. EDUCATION 3 hours** Areas of competence essential for participation as a citizen in decision making for education: the changing role of the school, the learner and the learning process, school finance, values that give direction to education, current issues in education.

**111. SECONDARY/ALL GRADES FIELD EXPERIENCE 1 hour** Observation and participation with students and teachers in schools. Seminars and conferences with University supervisor. Includes approximately 35 hours of field experience. Students seeking teacher certification in secondary education or all grades (Art, Music, Health, Physical Education, Industrial Technology) should complete the course during their freshman year.

**150. URBAN SCHOOL FIVE-DAY EXPERIENCE 1 hour** Observation and participation with students and teachers in an urban school for five consecutive school days - a minimum of 35 hours. School must be multicultural. 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.

**151. SUBURBAN OR RURAL SCHOOL FIVE-DAY EXPERIENCE 1 hour** Observation and participation with students and teachers in a suburban or rural school for five consecutive school days - a minimum of 35 hours. School must be in a suburban or rural 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.
195. ORIENTATION 1 hour 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 hour Assignment as a regular assistant in the Child Development Center. Registration with permission of the department chairman.

210. INTRODUCTION TO SPECIAL EDUCATION 3 hours Formerly 410. A course for education and non-education majors intended 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.

223. CHILD PSYCHOLOGY 4 hours Characteristics of the child at different levels of maturity; physical, mental and emotional growth; growth and organization of meanings; control of social and ethical behavior; development of personality. Includes approximately 30 hours field experience in the Child Development Center. Prerequisites: Students seeking certification, Psychology 100 and Education 100 with grades of "C" or better. Other students, Psychology 100.

224. ADOLESCENT PSYCHOLOGY 4 hours The adolescent's physical, social, emotional, and intellectual development in accordance with genetic constitution and environmental forces from birth. Includes approximately 30 hours field experience. Prerequisite: students seeking certification, Psychology 100 and Education 100 with grades of "C" or better; other students, Psychology 100.

230. INTRODUCTION TO GIFTED EDUCATION 3 hours An introduction to gifted children and adolescents; covering topics such as identification of the gifted, self-concept of the gifted; Renzulli's Enrichment Triad and Revolving Door Identification Model; IEP's for the gifted, gifted pre-school children, and parenting the gifted. Anticipated field experience would include a school for the gifted and programs for the gifted within the usual schools.

250. INSTRUCTIONAL MEDIA IN EDUCATION 3 hours Preparation, evaluation and selection of instructional materials; effective utilization to facilitate learning. Includes lab for development of competence in operating audio-visual equipment and preparing instructional materials.

251. INSTRUCTIONAL MEDIA LABORATORY 1 hour Development of competence in operating audio-visual equipment and preparing instructional materials.

280. SCHOOL AND SOCIETY 3 hours Schools in relation to their supporting society; democracy in its relation to schools; the responsibility of educators to the community and to the school; the nature, type and limitations of both the official and unofficial controls of schools. Not open to students seeking secondary (7-12) or all grades (K-12) certification.

281. TEACHING IN THE ELEMENTARY SCHOOL 4 hours Concentration on the elementary school curriculum in relation to the initial development of teaching qualities across a broad spectrum rather than specific subject matter methods. Attention will be placed on commitment, sensitivity, resourcefulness, and organizational abilities; developing a personal philosophy toward teaching; and demonstrating competency in the basic teaching skills. Included is an understanding of Public Law 94-142 and its effect on classroom teachers who are assigned mainstreamed children. A minimum of 5 hours of supervised field experience in a school setting involving handicapped children is required. Prerequisites: Psychology 100 and Education 100 with a grade of "C" or better.

290. SPECIAL TOPICS IN EDUCATION 1-3 hours

308. TEACHING MATHEMATICS IN THE ELEMENTARY SCHOOL 4 hours Content, strategies, materials, and evaluation that reflect the current emphasis in mathematics. Includes approximately 30 hours field experience. Prerequisites: 9 hours of college mathematics, admission to teacher education.

309. TEACHING SCIENCE IN THE ELEMENTARY SCHOOL 4 hours The role of science in childhood education, the preparation of materials, and organization of learning activities for problem solving. Includes approximately 30 hours field experience. Prerequisites: 10 hours of college science, admission to teacher education.
310. CHILDREN’S LITERATURE 4 hours
Knowledge and appreciation of children’s books and teaching of creative writing skills. Emphasis will be placed on the study of all areas of literature for children including realism, fantasy, folk literature, poetry, biography, and informational books. Includes approximately 30 hours of field experience. Prerequisites: English 200 and 351, admission to teacher education.

311. TEACHING SOCIAL STUDIES IN THE ELEMENTARY SCHOOL 4 hours
Objectives, trends, issues and evaluation of the teaching of social studies, relative to the concepts and principles underlying the disciplines of the social sciences. Includes approximately 30 hours of field experience. Prerequisites: 15 hours of college social sciences, admission to teacher education.

312. TEACHING READING I 4 hours
Introduction to reading. Emphasis will be placed on phonics, word attack skills, and communication skills including listening, speaking, spelling, grammar and usage. Includes approximately 30 hours of field experience. Prerequisite: Admission to teacher education.

314. TEACHING READING II 4 hours
Principles and methods of teaching reading, including comprehension skills, diagnostic skills, and preparation and evaluation of reading materials. Includes approximately 30 hours of field experience. Prerequisites: Education 312; admission to teacher education.

315. EDUCATION OF CHILDREN WITH LEARNING DISABILITIES (LD) 4 hours
(Formerly 415) 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: Education 210 and admission to teacher education.

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

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

331. PRACTICUM IN KINDERGARTEN EDUCATION 4 hours
Approximately 100 hours of field experience in a kindergarten classroom, plus seminars. Prerequisite: Education 330.

340. DIAGNOSIS AND CORRECTION OF READING DIFFICULTIES 3 hours
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: Education 312, 314, and admission to teacher education.

341. ADVANCED READING METHODS AND MATERIALS-CLINICAL 3 hours
Formerly 441. 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: Education 312, 314, 340 and admission to teacher education.

342. READING IN THE CONTENT AREA: SECONDARY EDUCATION 4 hours
Strategies for teaching developmental reading skills in a variety of curricular areas. Emphasis on the following aspects of reading: study skills, individualization, diagnosis, vocabulary, comprehension and evaluation. Includes approximately 25-35 hours of field experience. Prerequisite: Admission to teacher education.

350. DEPARTMENTAL FIELD EXPERIENCE 1 hour
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 completed in other professional education courses. Graded S-U. May be repeated once for a total of two hours credit.

360. EVALUATION AND MEASUREMENT OF LEARNER PROGRESS 3 hours
(Formerly 460). Evaluation and measurement as they apply to instruction. Attention is given to instructor-made tests, standardized tests and basic statistics.
365. CLASSROOM MANAGEMENT - THE EXCEPTIONAL LEARNER 4 hours (Formerly 415). 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 experiences. Includes approximately 30 hours of field experience. Prerequisites: Education 210 and admission to teacher education.

370. SOCIAL ISSUES AND THE SECONDARY SCHOOL 4 hours A sociologically oriented course analyzing the institution of education, focusing on the interrelation of schools to other institutions in society. Special emphasis on responsibilities and characteristics of teachers, students, and school administrators. Includes approximately 25-35 hours of field experience in an urban secondary school. Prerequisite: Admission to teacher education.

380. THE SECONDARY SCHOOL CURRICULUM 4 hours Secondary school curriculum standards, practices, instructional materials, curriculum development, functions, changes and trends. Includes approximately 25-35 hours of field experience. Prerequisite: Admission to teacher education.

420. METHODS OF TEACHING THE LEARNING DISABLED 3 hours Techniques and methods of educational intervention for children with learning disorders are related to diagnosis, material development, individual program development, and evaluation of pupil change in terms of academic skill development. Prerequisites: Admission to teacher education, Education 210, 315.

421. ASSESSMENT AND EVALUATION OF EXCEPTIONAL LEARNERS 3 hours Analysis, administration, and interpretation of criterion and norm referenced instruments used to appraise the perceptual, cognitive, and academic abilities and capabilities of the exceptional child. Prerequisites: Education 210, 315, 360. Admission to teacher education. Corequisite: Education 422.

422. STUDENT TEACHING - LEARNING DISABILITIES 9 hours Approximately 200 hours of classroom experiences in public school learning disabilities programs. Weekly seminars will also be held. Prerequisites: Education 210, 315, 360. Corequisites: Education 420, 421.

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

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

433. PHYSICAL GEOGRAPHY 3 hours A study and unification of the body of knowledge encompassing the earth sciences which give general insight into the nature of man's physical environment.

450. TEACHING METHODS IN THE SECONDARY SCHOOL 4 hours Methods, devices and techniques which are most effective in directing learning in the various subject areas at the high school level. Includes approximately 30 hours of field experience. Prerequisite: Admission to teacher education.

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

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

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

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

490. SPECIAL TOPICS IN EDUCATION 1-3 hours

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

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ENGLISH
(Department 112)

Professors Banks, Beck, Dornbusch, Magee, Oliver, R. Robinson; Associate Professors Green (Chairman), E. Miller

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

Advanced courses increasing the breadth and depth of the objectives listed above are offered as humanities electives and as part of the curriculum for majors. Only literature courses (excluding 204) and not writing or journalism courses can be used to fulfill general education requirements in the humanities. The only exceptions are 341 and 342. The prerequisite for 300 and 400 level courses is one course at the 200 level.

Two majors—English and Writing (as a second major only) are offered. The major in English provides for a concentration in writing. Two minors—Literature and Writing—are also offered. The programs are designed to help students apply a sound background in reading and writing to the requirements of journalism, communications, law, teaching, and other careers.

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

For a 45-hour major in English, the following courses are required: 201, 202, 203 (or suitable substitutes); 211, 212 (or suitable substitutes); 311 or 312; 351, 410; 489; and six free electives in English excluding journalism activities.

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

For a 45-hour major in English with a concentration in writing, the following credit-hour and course distribution is required: three hours-The English Language 351; 15 hours-journalism and advanced writing with The Senior Essay 489 required; three hours-Journalism Activities/Newsletter 250; 24 hours-literature electives (distributed by period and type).

For a 30-hour minor in literature, the following courses are required: 201, 202, 203; 211, 212; 311 or 312; 351; advanced writing—six hours (excluding Journalism
Activities), and one free elective—3 hours. Two approved literature courses (excluding Special Topics) may be substituted for one of the three English literature survey courses and for one of the two American literature survey courses.

For a 30-hour minor in writing, the following credit-hour and course distribution is required: three hours—The English Language 351; 12 hours—advanced writing, including up to 3 hours of Journalism Activities/Newspaper 250; and 15 hours—literature electives (distributed by period and type).

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

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."

110. WRITING 1 3 hours 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.

111. WRITING 2 3 hours Continuation of Writing 1. Prerequisite for English 204.

151. ENGLISH AS A SECOND LANGUAGE 3 hours Communication skills for non-native speakers of English with emphasis on reading and writing in a cultural context. English 151 may be substituted for English 110.

152. ENGLISH AS A SECOND LANGUAGE 3 hours Continuation of English 151. English 152 may be substituted for English 111.

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

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

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


203. ENGLISH LITERATURE AFTER 1830 3 hours A survey of Victorian and Modern literature.

204. GREAT WORKS OF LITERATURE 3 hours A study in depth of a small number of important literary texts. Prerequisite for all 300 and 400 level courses.

207. MODERN POETRY 3 hours 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 3 hours A study of modern drama, concentrating on major works and playwrights, including influences, movements and types.

209. MODERN FICTION 3 hours A study of selected works of modern fiction, including influences, movements and types.

211. AMERICAN LITERATURE TO 1865 3 hours A survey of Colonial and Romantic literature.

212. AMERICAN LITERATURE AFTER 1865 3 hours A survey of Modern literature.

221. WORLD LITERATURE 1 3 hours Major literary masterpieces of the ancient and medieval periods.

222. WORLD LITERATURE 2 3 hours Major literary masterpieces from the Renaissance to the mid-nineteenth century.

223. WORLD LITERATURE 3 3 hours Major literary masterpieces from the mid-nineteenth century to the present.

241. NEWSWRITING 3 hours The fundamentals of gathering information and writing for a newspaper.

243. MAGAZINE WRITING 3 hours The discipline and technique of writing articles for magazines.

244. PRESS/FREEDOM-LAW 3 hours A survey of press freedom and law in the United States, including recent developments within the collegiate press.

246. JOURNALISM LAYOUT AND DESIGN 3 hours The theory and technique of layout and design of newspapers and magazines.

250. JOURNALISM ACTIVITIES-NEWSPAPER 1 hour
251. JOURNALISM ACTIVITIES-
MAGAZINE 1 hour

252. JOURNALISM ACTIVITIES-
YEARBOOK 1 hour

253. JOURNALISM ACTIVITIES—
INTERNSHIP 1 hour Supervised work on
and contributions to the publications. The
student may enroll for only one activities
course per quarter. Six hours in one area or a
combination of six hours from the 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
with a concentration in writing or toward a
minor in writing. Journalism activities do NOT
count toward a major in English or toward a
minor in literature. No prerequisites.

290. SPECIAL TOPICS IN ENGLISH
1-3 hours

291. SPECIAL TOPICS IN WORLD
LITERATURE 1-3 hours

292. SPECIAL TOPICS IN ENGLISH
LITERATURE 1-3 hours

293. SPECIAL TOPICS IN AMERICAN
LITERATURE 1-3 hours

297. INDEPENDENT STUDY IN EN-
GLISH 1-3 hours

310. ENGLISH LITERATURE BEFORE
1500 3 hours 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.

311. SHAKESPEARE I 3 hours Representative
plays and poems.

312. SHAKESPEARE II 3 hours Continuation
of 311.

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

322. RESTORATION AND THE EIGHT-
TEENTH CENTURY 3 hours A concentrated
study of two or three major writers, move-
ments, or genres in the Neo-Classical period.

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

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

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

334. MAJOR AMERICAN WRITERS OF
THE NINETEENTH CENTURY 3 hours A
concentrated study of selected nineteenth-
century writers.

335. MAJOR AMERICAN WRITERS OF
THE TWENTIETH CENTURY 3 hours A
concentrated study of selected twentieth-
century writers.

341. POETRY WRITING 3 hours The dis-
cipline and technique of writing poetry. Pre-
requisite: a literature course above the fresh-
man level. Graded S-U. May be continued as
498 (independent study in writing).

342. FICTION WRITING 3 hours The dis-
cipline and technique of writing fiction. Pre-
requisite: a literature course above the fresh-
man level. Graded S-U. May be continued as
498 (independent study in writing).

343. PERSUASIVE WRITING 3 hours An
advanced writing course stressing the art of
persuasive prose in letters, reports and cri-
tiques. Prerequisite: a literature course above the
freshman level. Graded S-U. May be con-
tinued as 498 (independent study in writing).

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

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

351. THE ENGLISH LANGUAGE 3 hours
An introduction to the study of linguistics with
the emphasis on a description of the struc-
ture of English grammar.

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

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

370. AFRICAN LITERATURE 3 hours
Novels and short stories that reflect African
imagination, mentality and ethnic life in coloni-
al and post-independence periods. This
course satisfies the general education
requirement for non-Western culture.
381. HISTORY OF LITERARY CRITICISM 3 hours Movements and major writers in literary criticism.

410. CHAUCER 3 hours A study of Chaucer with special emphasis on "The Canterbury Tales," some reading of the chief literary forms of the Middle Ages, some skill in understanding and reading Middle English.

489. THE SENIOR ESSAY 3 hours Required of all English majors during the senior year. The student will enroll in the quarter during which he expects to complete the essay.

490. SPECIAL TOPICS IN ENGLISH 1-3 hours

494. SEMINAR IN ENGLISH LITERATURE 3-6 hours

495. SEMINAR IN AMERICAN LITERATURE 3-6 hours

497. INDEPENDENT STUDY IN LITERATURE 1-3 hours

498. INDEPENDENT STUDY IN WRITING 1-3 hours

499. INDEPENDENT STUDY IN JOURNALISM 1-3 hours

FOREIGN LANGUAGES (Department 113)

Professors Davey (Chairman), Lippert; Associate Professor Khoury; Assistant Professor Dickson; Instructor Wolber

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. See departmental brochure for descriptions of career opportunities.

The University Audio Center provides the student with opportunities for language practice and extends his/her contact with the living language. Recorded materials used in the center are prepared as an adjunct to class work and are coordinated with class instruction. Additional materials including 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 major in French or Spanish: 45 hours are required above French 121 or Spanish 141; to include 327, 328, 329 (French) or 353, 354, 355 (Spanish). Students develop individual programs of study with advisers. Ordinarily courses are taken in sequence through the conversation and composition courses (300-level). Unless otherwise indicated, courses at the 300- and 400-level assume completion of conversation and composition courses.

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

For a minor in French, German or Spanish: 30 hours are required above French 121, German 131, or Spanish 141. Individual programs are devised for students, but emphasis is on language and civilization.

Individualized study in certain less frequently taught languages is provided under the auspices of the Audio Center. Students pursue taped courses in those languages elected, with the aid of native tutors. Selected qualified persons evaluate and grade student performance.

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

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

FRENCH

120. ELEMENTARY FRENCH 1 4 hours
To develop the ability to understand, speak, read and write French; functional grammar, early and fluent speaking; elementary reading based on French life, customs, and manners. Four class periods and one hour of scheduled laboratory/drill practice per week.

121. ELEMENTARY FRENCH 2 3 hours
Continuation of 120. Three class periods and one hour of scheduled laboratory/drill practice each week.

122. ELEMENTARY FRENCH 3 3 hours
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: 121 or proficiency established by placement examination.

210. BUSINESS FRENCH 3 hours

214. INTERMEDIATE FRENCH 1 4 hours
The completion of basic French grammar begun in Elementary French 1 and 2. Conversational practice and composition based on reading passages, films, popular music, and "cultural" capsules. Four class periods and one hour of scheduled laboratory/drill practice per week. Prerequisite: 122 or proficiency established by placement examination.

215. INTERMEDIATE FRENCH 2 4 hours
Continuation of 214.

217. FRENCH PHONETICS 3 hours
A basic introduction to linguistic terminology and a comparative analysis of the French and English sound systems, with emphasis on improving students' pronunciation in French. Open to all students. Prerequisites: 113-122 or permission of the department.

219. INTRODUCTION TO FRENCH LITERATURE 3 hours
An intermediate-level course intended as an introduction to serious reading in French. Class discussion, in French, based on selections of short literary masterpieces (classic and modern).

290. SPECIAL TOPICS IN FRENCH 1-3 hours

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

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

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

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

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

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

316. THE FRENCH TEXT: THE ESSAY AND NON-LITERARY TEXTS 3 hours
Study of selected essays from the work of Montaigne, Pascal, Rousseau, Camus, Sartre and others. Survey of the French press. Reading in Le Monde, l'Express, other periodicals and non-literary works.
319. FRENCH POETRY AND SONG
3 hours Rules of French versification. Study of selected works of major poets from the Middle Ages to the twentieth century. Modern interpretations of poetry into song by Brassens, Ferrat, Moustaki and others.

327. CIVILISATION FRANCAISE: LA VIE CONTEMPORAINE 3 hours Introduction to contemporary French culture, an interdisciplinary approach. Includes such topics as class, the family, leisure activities, attitudes, communication, role of the arts, political parties, education.

328. CIVILISATION FRANCAISE: L'HISTOIRE DE LA FRANCE 3 hours A survey of the history, geography, political institutions of France.

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

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

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

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

490. SPECIAL TOPICS IN FRENCH 1-3 hours
497. INDEPENDENT STUDY IN FRENCH 1-3 hours

GERMAN

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

131. ELEMENTARY GERMAN 2 3 hours
Continuation of 130. Three class periods and one hour of scheduled laboratory/drill practice each week.

132. ELEMENTARY GERMAN 3 3 hours
A conversation and culture course with limited presentation of structural items, designed to improve language skills introduced in the first two courses. Based on Germanic cultural perspectives, the course emphasizes speaking and understanding through conversations in German, role playing and skits. Some written practice. Prerequisite: German 131 or proficiency established by placement examination.

220. BUSINESS GERMAN 3 hours A survey of German business practice including office procedure and advertisements. Students develop writing and conversational skills related to business. Some translation. Prerequisite: 225 or permission of department.

224. INTERMEDIATE GERMAN 1 4 hours
Review of the fundamentals of grammar, pronunciation, vocabulary, and idioms; conversational practice and composition; readings and discussion about German life and culture; occasional viewing of slides, films, and newsreels. Four class periods and two hours of scheduled laboratory practice per week. Prerequisite: 132 or proficiency established by placement examination.

225. INTERMEDIATE GERMAN 2 4 hours
Continuation of 224.

261. INTRODUCTION TO GERMAN LITERATURE 3 hours Reading and discussion of well-known poetry, plays, and short prose selections, from classic to contemporary. Presentations, in German, to focus on genre, the work as representative of literary movements, and the reflection of society and social change in literature. Prerequisite: 132 or permission of the department.

291. SPECIAL TOPICS IN GERMAN 1-3 hours
298. INDEPENDENT STUDY IN GERMAN 1-3 hours
321. GERMAN CONVERSATION AND COMPOSITION 1 3 hours
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: 225 or proficiency established by placement examination.

322. GERMAN CONVERSATION AND COMPOSITION 2 3 hours Continuation of 321.

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

337. THE GERMAN-SPEAKING WORLD 3 hours 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: 225 or permission of the department.

338. CONTEMPORARY WEST GERMANY 3 hours A close examination of the Federal Republic from its beginning to the present. 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: 225 or permission of the department.

339. EAST GERMANY-AUSTRIA-SWITZERLAND 3 hours A study of contemporary social, cultural, and political elements in the three 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: 225 or permission of the department.

491. SPECIAL TOPICS IN GERMAN 1-3 hours

498. INDEPENDENT STUDY IN GERMAN 1-3 hours

SPANISH

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

141. ELEMENTARY SPANISH 2 3 hours Continuation of 140. Three class periods and one hour of scheduled laboratory/drift practice each week.

142. ELEMENTARY SPANISH 3 3 hours 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: 141 or proficiency established by placement examination.

240. BUSINESS SPANISH 3 hours A survey of Spanish business practice including office procedure and advertisements. Students develop writing and conversational skills related to business. Some translation. Prerequisite: 245.

244. INTERMEDIATE SPANISH 1 4 hours A review of grammar and pronunciation; conversational practice and occasional lectures in Spanish on Hispanic life, history, art and civilization, illustrated with slides, photographs, reproductions, and realia. Four class periods and two hours of scheduled laboratory practice per week. Prerequisite: 142 or proficiency established by placement examination.

245. INTERMEDIATE SPANISH 2 4 hours Continuation of 244.

248. SPANISH PHONETICS 3 hours A basic introduction to linguistic terminology and a comparative analysis of the Spanish and English sound systems, with emphasis on improving students' pronunciation in Spanish. Open to all students. Prerequisite: 142 or permission of the department.

292. SPECIAL TOPICS IN SPANISH 1-3 hours

299. INDEPENDENT STUDY IN SPANISH 1-3 hours

341. SPANISH CONVERSATION AND COMPOSITION 3 hours To develop a useful command of the language; current periodicals and realia; audio visual materials. A study of grammatical and phonetic problems aimed at perfecting clarity and accuracy of expression. Occasional laboratory practice. Prerequisite: 245 or permission of the department.
342. ADVANCED SPANISH LANGUAGE STUDY 3 hours An intensive study of grammar and syntax with emphasis on constructions of high-frequency usage. Written compositions and oral practice. Prerequisite: 341 or permission of the department.

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

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

351. HISPANIC CULTURAL PERSPECTIVES 3 hours A study of how Spaniards and Spanish Americans view the world, in contrast to typical American perspectives. Emphasis on the various social concepts, attitudes, orientations, and life styles which make up different and sometimes unique points of view. Counts for the Spanish major or minor, but is not a substitute for General Education or in-depth courses. Permission of department required.

353. CIVILIZACION HISPANICA I 3 hours Integrates the geographical, political, economic, social, and cultural forces which have molded Spain from prehistoric times to the nineteenth century. Outside reading and written reports on assigned topics. Required for all Spanish majors. Prerequisite: 342 or permission of department.

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

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

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

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

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

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

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

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

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

492. SPECIAL TOPICS IN SPANISH 1-3 hours

496. SEMINAR IN SPANISH 1-3 hours

499. INDEPENDENT STUDY IN SPANISH 1-3 hours

INDEPENDENT STUDY COURSES

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

114. ELEMENTARY ARABIC 2 3 hours Continuation of 113-113.
HEALTH, PHYSICAL EDUCATION AND SPORTS STUDIES
(Department 143)

Associate Professors Campoli, Daugherty, Lauth, Strayer, Wallace; Assistant Professors Kittell (Chairperson), Kratz, Thayer; Instructors Kaczkowski, Keller.

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

Intramural Sports. An intramural program offers activity for each university student. The following sports are offered for men: touch football, basketball, softball, billiards, ping pong, bowling, swimming, handball, racquetball, volleyball, tennis, wrestling, track, golf, one-on-one basketball, and horse-shoes; for women: touch football, softball, volleyball, basketball, badminton, swimming, racquetball, three-on-three basketball, three-on-three volleyball, table tennis, archery, track and field; coed: water polo, volleyball, basketball, softball, wallyball, and triathlon.

Special requirements for majors/minors within the department To satisfy the requirements for a teaching field in health and physical education, all students are required to complete the following for final approval by the department.
1. Participation during the junior year in one of the three courses 304-305-306 practical techniques of teaching and assisting in health and physical education.
2. Completion of field experiences required by the Education Department.
3. Successful completion of one quarter of aquatics prior to graduation.
4. Physical education majors are exempt from the service class requirement.

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

In the College of Arts and Sciences two of the three required hours must be taken in either the pool or the gymnasium. However, the other one hour may be taken in the gymnasium or in McIntosh Center. The required physical education service courses are not sequential and should be completed prior to senior status. None of the service courses may be repeated for graduation.
The following service courses are offered. All carry one quarter hour credit; and a maximum of six hours may be counted toward graduation in the College of Arts and Sciences. Students may not receive credit toward graduation for more than one quarter-hour of physical education service credit during their collegiate career for any single varsity sport. Additional fees are charged for bowling, billiards, archery, racquetball, golf and tennis.

001. VARSITY FOOTBALL PARTICIPATION 1 hour

002. VARSITY CROSS COUNTRY PARTICIPATION 1 hour

003. VARSITY SOCCER PARTICIPATION 1 hour

004. VARSITY VOLLEYBALL PARTICIPATION 1 hour

005. VARSITY BASKETBALL PARTICIPATION (MEN) 1 hour

006. VARSITY BASKETBALL PARTICIPATION (WOMEN) 1 hour

010. VARSITY TRACK PARTICIPATION (WOMEN) 1 hour

011. VARSITY WRESTLING PARTICIPATION 1 hour

012. VARSITY TRACK PARTICIPATION (MEN) 1 hour

013. VARSITY TENNIS PARTICIPATION (MEN) 1 hour

014. VARSITY TENNIS PARTICIPATION (WOMEN) 1 hour

015. VARSITY GOLF PARTICIPATION 1 hour

016. VARSITY SOFTBALL PARTICIPATION 1 hour

017. VARSITY BASEBALL PARTICIPATION 1 hour

018. VARSITY SWIMMING PARTICIPATION 1 hour

021. WEIGHT TRAINING AND PHYSICAL CONDITIONING 1 hour 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.

022. TUMBLING AND APPARATUS 1 hour To acquaint students with the principles of apparatus work. To help improve posture and body mechanics. To develop body coordination, strength and flexibility, and to create interest in a growing sport for possible future development by the individual. Offered on demand.

023. RECREATIONAL GAMES 1 hour To provide the student with background to enjoy the popular social games of backgammon, bridge, and cycling. To provide the student with the opportunity to use the swimming pool and the fitness trail.

024. BEGINNERS GOLF 1 hour 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.

025. SOCCER AND SOFTBALL 1 hour To provide the student with basic skills in both soccer and softball. To provide a basic understanding and appreciation for the games themselves. To promote some degree of physical activity which should help an individual be more fit. Offered on demand.

026. TUMBLING AND TRAMPOLINE 1 hour To develop knowledge of the history, rules, safety and terminology for the use of the trampoline. To develop skills in performing a seat drop, front drop, knee drop, one-half and full twists as well as a combination of all listed. To develop body coordination and strength, plus flexibility. Offered on demand.

028. FLASHBALL AND SPEEDBALL 1 hour To develop the skills and understanding of the game of Flashball and how it relates to regular football. To participate in the sport with the aim of furthering the intramural program. To improve conditioning and coordination of the participant and to provide carry over value in later life. Offered on demand.

029. RACQUETBALL 1 hour To learn the basic skills and rules of racquetball so that one can become fit and a competent participant. To promote fitness in later life. To provide enough information that the student will become a better spectator in regard to the history and rules of the sport.
030. BEGINNERS SWIMMING 1 hour
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 Lifesaving and Water Safety Instructors certificate. Intermediate and advanced swimmers should not register for this course.

032. BASKETBALL 1 hour Elementary fundamentals in such skills as ‘shooting’ (lay-ups, free throw, jump shot); ‘dribbling’ (speed and control); ‘passing and receiving’ (two hand chest pass, wrap around, overhead pass, bounce pass); ‘basics of defense’ (stance, help-side technique, etc.); ‘half and full court’ games (2 on 2, 3 on 3, 4 on 4, 5 on 5). This course is not recommended for students who have played basketball on the high school level (competitive play).

033. INTERMEDIATE SWIMMING 1 hour
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 hour To offer each student an opportunity to understand the fundamentals of bowling. To teach scoring, rules of etiquette and common courtesies. To develop coordination and provide an appreciation of the sport as a carry over in their personal lives.

035. SWIMMERS 1 hour To provide the individual with additional strokes and miscellaneous water skills that will make the individual an all-round swimmer.

040. POCKET BILLARDS 1 hour To learn the etiquette of the game, to be able to care for the equipment, most basic terminology, fundamentals, rules of some games and to create an interest so that carry over values will be obtained.

050. SOCIAL DANCE 1 hour The student is introduced to the traditional dance (i.e., waltz, foxtrot, swing, samba, rhumba, cha-cha, tango). To acquire an understanding of dances and courtesies of dance. To identify music for appropriate dances. To develop basic knowledge of social dance steps, execution, leading and following.

060. ARCHERY 1 hour The scope and extent of archery, selection of equipment, safety, bracing of the bow, methods of shooting, points of aim, scoring, correction of problems. Use of indoor and outdoor ranges.

072. GYMNASTICS, RHYTHM AND FREE EXERCISE 1 hour This course includes participation in gymnastic like and/or rhythmic activities. It is not an apparatus course but rather pertains to free exercise and rhythmic gymnastics skills (use of balls, hoops, wands, ropes, etc.). Offered on demand.

078. BADMINTON 1 hour To develop basic knowledge of history, rules, scoring, strategies in playing both doubles and singles badminton matches.

079. GYMNASTICS APPARATUS-FREE EXERCISE 1 hour To develop a knowledge and appreciation of the many values of gymnastics. To be able to analyze both abilities and limitations in the use of the body. To be able to identify and define strength, endurance, agility and flexibility as necessary elements of gymnastics and to be able to enumerate means of developing each. To be able to apply standards of safety and spotting to the activities to performance. To be able to identify and define elements of routines on each specific apparatus. To be able to combine and execute those skills necessary in a performance on each individual apparatus. Offered on demand.

080. BEGINNING TENNIS 1 hour Recommended for non-tennis players. To develop basic knowledge of history, rules, serving, strategies in playing both doubles and singles match. To develop basic skills in executing the ground strokes, the service, the volley, lob, and smash shots with minimum success. To provide a basic understanding and appreciation of the game of tennis.

083. SQUARE AND FOLK DANCE 1 hour 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.

085. INTERMEDIATE TENNIS 1 hour To develop and improve on skills already acquired. To develop a competitive knowledge of strategies for playing both singles and doubles tennis matches. To improve on
skills in executing the ground strokes, serve, volley, lob and smash shots. This course is not for beginners.

086. VOLLEYBALL 1 hour To recognize and appreciate the values of volleyball as a highly skilled, competitive game as well as a recreational activity. To perform basic skills and combination of skills pertinent to volleyball so that the student is able to demonstrate success and satisfaction both in drills and game like situations. To demonstrate an understanding of official rules, related to volleyball, by application in a game situation and in written test performance.

087. AEROBIC EXERCISE 1 hour To help students develop an understanding of aerobic exercise and take the opportunity to pick one or two activities to accomplish their own individual conditional needs. To help students create an interest so that carry over values will be obtained.

Athletic Training Certification Program (Sport Medicine Major or Athletic Training Minor) The athletic trainer is an important part of a complete athletic program. He/she is the individual charged with preventing athletic injury whenever possible, administering first aid if an injury should occur, and supervising the rehabilitation program designed in cooperation with the team physician. Students wishing to pursue the sports medicine major may choose to pursue a college major in another academic discipline. Candidates may qualify to be examined for National Athletic Training Association (NATA) certification through the apprenticeship program (program A) or with a minor in athletic training the institutional certification program (program B).

In the apprenticeship program (sports medicine major) students are expected to take part in 1800 hours of practical work experience throughout the four years of study. These opportunities enable the prospective athletic trainer to perform many of the duties of an athletic trainer while under the direct supervision of the Ohio Northern University.

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

The University also provides an alternative program involving only 800 hours of practical work experiences at the University for future athletic trainers (minors). Individuals successfully completing this option will receive an institutional certificate as an athletic trainer and must obtain an additional 1000 hours of practical work experience while serving as an athletic trainer (under a NATA trainer) prior to sitting for the NATA examination.

Required courses for Sports Medicine Major (45 hours):

Required courses for Athletic Training Minor (36 hours): Biology 231, 232, 233, (plus 1800 or 800 apprentice hours). (The 800 hours require 1000 more hours prior to sitting for the NATA examination.)

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

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

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

**MAJORS IN HEALTH AND/OR PHYSICAL EDUCATION, SPORTS MEDICINE, AND SPORTS MANAGEMENT**
The department offers a major in the following programs:
- Health and Physical Education K-12
- Physical Education K-12
- Health Education K-12
- Physical Education 7-12
- Sports Medicine
- Sports Management

The areas indicated are the only areas that the department recognizes as a major. The other areas of certification require a college major in another academic discipline.

Additionally, the students are able to obtain a certification or a minor (not a major) in the following:
- Health Education 7-12
- Elementary Physical Education K-6
- Physical Education 7-12
- Athletic Training (Program A), apprenticeship program of the National Athletic Trainers Association—NATA; Program B, institutional certification.

Finally, the department provides courses of study leading to validation or certification in Drivers Education.

For specific information concerning these areas of certification, please contact the Health and Physical Education Department Chairman.

**Required courses for Dual Major in Health and Physical Education K-12 (87-90 hours):**
- Biology 231, 232, 233; Sociology 105; PHE 000, 111, 112, 119, 132, 133, 147, 151, 211, 212, 213, 223, 233, 271, 303, 304, 305, six hours of coaching (308, 310, 319, 320, 321, 322, 323, 327) 343, 350, 351, 360, 402, one quarter of aquatics, four hours of electives in physical education, and six hours of electives in health.

**Required courses for Physical Education Major K-12 (69-71 hours):**
- Biology 231, 232, 233; HPE 112, 119, 132, 133, 147, 151, 211, 212, 213, 223, 233, 271, 303, 304, 305, six hours of coaching, 351, 360, 402, one quarter of aquatics, five hours of physical education electives.

**Required courses for Health Education Major K-12 (46 hours):**
- Biology 231, 232, 233; Sociology 105; HPE 111, 112, 119, 303, 343, 350, 12 hours of electives.

**Required courses for Physical Education Major 7-12 (45-47 hours):**
- Biology 231, 233; PE 112, 132, 147, 151, 211, 212, 213, 223, 303, 304, 351, 402, one quarter of aquatics, six hours of physical education electives.

**Required Courses for Sports Management Major HPE 111, 112, 151, 256, 486, 496, 303; Communication Arts 121, 130, 321, 421 and two of the following: 221, 311, 315, 330, 430; two of the following: HPE 324, Sociology/Psychology 203, 301, 316; Business 322, 330 and three of the following: 131, 323, 325, 335, 363, 365, 351, 371, 372.

Those interested in pursuing a career as a Sports Media Specialist should elect as many of the following as possible after those selected above. HPE 150, 251, 252, 340, 430; English 241, 243, 244, 343, 344.

**Required courses for Health Education Minor 7-12 (32 hours):**
- Biology 231, 233; HPE 111, 112, 119, 350, 351, 343, six hours of electives.

**Required courses for Physical Education Minor K-6 (36 hours):**
- (For elementary education majors only) Biology 231, 232; PE 112, 133, 147, 212, 223, 233, 271, 360, 402, three hours of physical education electives.

**Required courses for Physical Education Minor 7-12 (36-39 hours):**
- Biology 231, 233; PE 112, 132, 147, 151, 211, 212, 213, 223, 303, 304, one quarter of aquatics, three hours of physical education electives.

**Required courses for Drivers Education Certification:**
- HPE 219, 433, 434.

All required courses must be completed with a grade of "C" or better.

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**000. ORIENTATION, HEALTH & PHYSICAL EDUCATION 1 hour** Introduction to the profession of Health, Physical Education, Recreation, Dance & Athletics.

**110. INTRODUCTION TO HEALTH AND FITNESS (WELLNESS) 3 hours** A beginning course designed for the individual who wishes to gain knowledge, skill and experience in managing one's lifestyle in a positive manner. The primary purpose of this course is to acquaint students with the 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. This course is 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.

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

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

113. MULTI-MEDIA FIRST AID AND CPR 3 hours Multi-media approach to the teaching of basic first aid. American Red Cross multi-media certification in first aid. American Red Cross certification in CPR. Culminating learning experiences involve activities leading to the awarding of the American Red Cross FIRST AID INSTRUCTORS CERTIFICATE (Multi-Media) and the American Red Cross CPR INSTRUCTORS CERTIFICATE. Credit may be received for either 143-112 or 143-113, but not for both.

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

115. WATER SAFETY INSTRUCTION 3 hours Teaching of swimming and water safety skills, methods and techniques. Successful completion of the course will lead to American Red Cross Water Safety Instruction certification. Meets 5 days per week. Prerequisite: Current certification in advanced lifesaving.

119. SCHOOL AND COMMUNITY HEALTH 3 hours Skills and knowledge for aiding teachers and others to observe and understand the school child in health and illness; the health program of the public schools and the relationship of the school to the students' habits, attitudes and knowledge conducive to good health. The study of health matters with focus on health problems amenable to community action. Health and physical education majors only or permission of department chairman.

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

133. GENERAL METHODS - MAJORS 2 hours The fundamental skills, methods and techniques in teaching the following activities: track and field, basketball, softball, recreational games. Offered alternate years (1986-87).

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

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

210. ADVANCED FIRST AID-EMERGENCY CARE 3 hours This course is offered to the student who wishes to increase knowledge, skill and experience in the application of first aid and emergency care. Students enrolling in this course 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. Up to 3 six-hour lab days will be scheduled.

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

212. DANCE - MAJORS 3 hours 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
alternate years (1986-87).

213. INDIVIDUAL-DUAL ACTIVITIES -
MAJORS 2 hours The fundamental skills,
methods and techniques in teaching the fol-
lowing activities: tennis, badminton, archery,
golf, weight lifting and bowling. Offered alter-
uate years (1985-86).

219. PSYCHOLOGICAL FACTORS IN
DRIVING 3 hours A study of behavior with
emphasis on attitudes, motivation, and
adjustment and their relationship to unsafe
driving. Investigation of principles and
methods appropriate in identifying, under-
standing, and modifying unsatisfactory driving
behavior. Prerequisite: Psychology 100.
Course marked S/U. Offered alternate years
(1986-87).

223. KINESIOLOGY 3 hours The study of
the general body mechanics of the human
organism; the activities of the physical educa-
tion program in their relation to coordination
and the proper body mechanics, analysis of
movement. Prerequisites: Physiology 231 and
232.

233. PHYSICAL EDUCATION FOR THE
ELEMENTARY SCHOOL 3 hours The
aims, objectives, methods, and techniques of
teaching physical education in the elemen-
tary school. The need for physical activity
and practical application of theories are
emphasized. Prerequisite: sophomore stand-
ing. Includes approximately 10 hours of field
experience.

256. SOCIOLOGY OF SPORT 3 hours
The study of the broad prospective of sport in
society; sport as it differs from play and
game; the relationship between sport and
 economics, politics, popular culture, mass
media, religion, law, minorities, females, and
education; sport and socialization, social
structure and stratification, social mobility and
deviance.

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

303. ORGANIZATION AND ADMINIS-
TRATION OF HEALTH, PHYSICAL
EDUCATION, RECREATION AND
ATHLETICS 3 hours Examination of the phi-
losophy, principles, problems, policies and
procedures essential in the organization and
administration of meaningful programs in
health education, physical education, recrea-
tion and athletics. Prerequisite: One year of
physical education for majors and junior
status.

304. PRACTICAL TECHNIQUES OF
TEACHING AND ASSISTING IN
HEALTH AND PHYSICAL EDUCATION
1 hour Required of all physical education
majors, preferably in their junior year. This
class involves assisting in service classes.

305. PRACTICAL TECHNIQUES OF
TEACHING AND ASSISTING IN
HEALTH AND PHYSICAL EDUCATION
1 hour Continuation of 143-304. Required of
all physical education majors. Prerequisite:
143-304.

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

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

310. TECHNIQUES - COACHING SOFT-
BALL 2 hours To develop a basic expertise
in the knowledge and techniques of coaching
softball. To provide laboratory experiences in
the practical application of techniques and
knowledge of coaching softball. Offered alter-
nate years (1986-87).

315. OFFICIATING-VOLLEYBALL
2 hours Knowledge and techniques of offi-
Laboratory experiences during intramural vol-
leyball. Offered odd numbered years only.
Federation licensing available upon success-
ful completion of course.

317. THEORY OF TRACK AND FIELD
OFFICIATING 2 hours Knowledge and
techniques of officiating track and field.
National Federation rules. Laboratory expe-
riences during intramural track and field.
Offered even numbered years only.
319. THEORY AND METHOD OF COACHING TRACK 2 hours Methods and forms for all of the events in track and field. Lectures, reports, demonstrations and practice. Offered alternate years (1986-87).

320. THEORY OF COACHING AND OFFICIATING WRESTLING 2 hours Equipment, fundamentals of the art and skill of wrestling. Prerequisite for students seeking state certification in physical education: junior status. Offered even numbered years only.

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

322. THEORY OF COACHING BASKETBALL 2 hours The fundamentals: passing, shooting, dribbling, feinting and pivoting, styles of offense and defense, equipment, conditioning, the handling of a team in games. Lectures, demonstrations and practice. Open to juniors and seniors only or by permission of instructor.

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

324. PSYCHOLOGY OF COACHING 3 hours The cultural, emotional, psychological and sociological aspects of coaching. Player-coach relationship, understanding the athlete, improving coaching effectiveness.

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

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

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

335. ADVANCED COACHING INTERNSHIP-EXTERNSHIP 1-3 hours Prerequisite: Permission of department chairperson.

336. ADVANCED COACHING INTERNSHIP-EXTERNSHIP 1-3 hours Prerequisite: Permission of department chairperson.

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

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

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

350. HEALTH METHODS AND EVALUATION 3 hours For the special teacher and supervisor of health; health problems arising in a school system; methods and materials for teaching health and conducting evaluation. Prerequisites: two quarters of health, one of which must be 143-111 and junior standing. Includes approximately 30 hours of field experience, unless completed in Health & PE 351.

351. METHODS IN HEALTH AND PHYSICAL EDUCATION. 3 hours Methods, devices and techniques which are most effective in the teaching of the discipline in the public schools. Lab experiences in area schools. Prerequisite: one year of physical education for majors and junior status. Includes approximately 30 hours of field experience, unless completed in Health & PE 350.

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

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

372. RECOGNITION, EVALUATION AND TREATMENT OF ATHLETIC INJURIES 4 hours Prerequisite: 143-371.

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

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

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

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

486. SPORTS MANAGEMENT INTERNSHIP 8-15 hours 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. 1-15 hours

490. SPECIAL TOPICS IN HEALTH, PHYSICAL EDUCATION, SPORTS 1-3 hours Specially planned work throughout the quarter. Permission of department chair.

494. HEALTH SEMINAR 3 hours An indepth analysis of current health problems, issues and trends as they apply to the teacher of health education. Offered even numbered years only.

496. SPORTS MANAGEMENT SEMINAR 1 hour 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 1-3 hours

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

Professors Saffell (Chairman), Davis, Gilbreth, Hammond, Ludanyi, Peltier; Assistant Professors Bessen, Wilson.

The Wilfred E. Binkley Chair of History and Political Science, inaugurated in 1971, has been made possible by a grant from the Carthage Foundation of Pittsburgh. The 1985-86 recipient of this professorship is Terry J. Gilbreth, Professor of Political Science.

The Kernan Robson Chair in Political Science, inaugurated in 1972, has been made possible by a trust established by the late Kernan Robson. The 1985-86 recipient of this professorship is Robert R. Davis, Professor of History and Political Science.

The department offers separate majors and minors in history, political science, public administration and international studies. To pursue a dual major students must complete all the requirements for each separate major. Department majors are required to complete two research papers—one in their junior year and one in their senior year.

A major in history and political science prepares students generally for careers in teaching, law, journalism, government service, or business. Public Administration is designed especially for students seeking a career in government service or in law. There are special departmental advisers for prelaw, public administration, and teacher certification.

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

### History

Specific requirements for the history major:
1. Orientation 000
2. History 110-111
3. History 200
4. Political Science 201-202-203
5. History 211-212-213
6. One contemporary affairs course (221-222-223-224-225-226)
7. 27 hours history electives, distributed as follows:
   - World History—6 hours (excluding contemporary affairs courses)
   - American History—6 hours
   - Electives—18 hours (excluding contemporary affairs courses)

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000. ORIENTATION 1 hour Familiarization with the department, requirements for majors, planning a program of courses, the University catalog and library. Required of departmental majors. Also listed as Political Science 000.

100. UNDERSTANDING HISTORY 3 hours Concepts and trends in world history. A conceptual and thematic approach to the meaning and content of history.

110. WESTERN CIVILIZATION I 3 hours 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. (Formerly 215).

111. WESTERN CIVILIZATION II 3 hours 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. (Formerly 216).

200. RESEARCH METHODS 1 hour Instruction in research methods appropriate for History, Political Science, and Public Administration majors. Students will become familiar with relevant library and other resource materials and they will learn ways of organizing and writing research papers. Also listed as Political Science 200.

211. HISTORY OF THE UNITED STATES TO 1800 3 hours 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 hours 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 hours A survey of the United States history in the twentieth century. Major topics include the role of the U.S. in the world and of the U.S. government at home.

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

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

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

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

225. CONTEMPORARY LATIN AMERICA 3 hours An examination of the political, socioeconomic and intellectual development of Latin America since the conclusion of the second World War. Also listed as Political Science 225. Open to freshmen.
226. HUMAN GEOGRAPHY 3 hours An analysis of the elements of human geography, including cultures, cultural regions, race, language and religion, human population, population movement, urbanization, and political organization. Also listed as Political Science 226. Open to freshmen.

285. THE MILITARY AND SOCIETY IN THE WEST 3 hours 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 1-3 hours

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

310. AMERICAN URBAN HISTORY 3 hours 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. Also listed as Political Science 310.

321. ENGLISH HISTORY I 3 hours The English people in their political, social, and institutional development from the beginning of recorded history to the conclusion of the Wars of the Roses.

322. ENGLISH HISTORY II 3 hours An examination of the Tudor-Stuart period with special emphasis on the Henrician Reformation, the emergence of England as a world power, and the seventeenth century conflict between the Crown and Parliament.

323. ENGLISH HISTORY III 3 hours An examination of England and the political, social, and institutional development of the English people from the end of the Stuart period to the present including the growth of the British Empire.

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

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

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

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

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

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

348. AMERICAN CONSTITUTION I 3 hours 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. Also listed as History 348.

349. AMERICAN CONSTITUTION II 3 hours The adaptation of the original Constitution to twentieth century problems of economic regulation, civil rights, industrial liberation, the welfare state and the American Empire. Also listed as History 349.

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

354. CIVIL WAR AND RECONSTRUCTION 3 hours An intensive analysis of the Civil War era in American history. Special emphasis will be placed on slavery and other causal factors which precipitated the war between the states.
360. HISTORY OF AMERICAN BUSINESS AND LABOR 3 hours An historical study exploring the interaction of economic and political forces as a factor helping to explain the position occupied by business enterprises and labor organizations in American political life. Also listed as Political Science 360.

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

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

365. AFRO-AMERICAN HISTORY 3 hours The essential facts, trends, and interpretations in the history of the black American from African beginnings to the present time.

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

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

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

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

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

414. THE ANCIENT WORLD 3 hours A survey of the political, social, and economic development of Near Eastern, Greek, and Roman civilizations during the ancient period.

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

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

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

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

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

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

481. PUBLIC SERVICE INTERNSHIP PROGRAM 6-15 hours 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. Also listed as Political Science 481.

490. SPECIAL TOPICS IN HISTORY 1-3 hours

494. SEMINAR IN HISTORY 1-3 hours

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

Political Science

1. Orientation 000
2. Political Science 105
3. Political Science 200
4. Political Science 201-202-203
5. History 211-212-213
6. One contemporary affairs course (221-222-223-224-225-226)
7. Western Political Thought 455
8. Political Thought 456 or 457 or 387
9. 27 hours political science electives, distributed as follows:
   World Politics—6 hours (excluding contemporary affairs courses)
   U.S. Government—6 hours
   Electives—15 hours (excluding contemporary affairs courses)

000. ORIENTATION 1 hour Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Required of departmental majors. Also listed as History 000.

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

200. RESEARCH METHODS 1 hour Instruction in research methods appropriate for History, Political Science, and Public Administration majors. Students will become familiar with relevant library and other resource materials and they will learn ways of organizing and writing research papers. Also listed as History 200.

201. AMERICAN NATIONAL GOVERNMENT I 3 hours An examination of the Constitution, federalism, interest groups, public opinion, political parties, and elections. Open to freshmen.

202. AMERICAN NATIONAL GOVERNMENT II 3 hours 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 hours An examination of the structures and functions of state and local governments in the United States. Open to freshmen.

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

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

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

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

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

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

291. SPECIAL TOPICS IN POLITICAL SCIENCE 1-3 hours

310. AMERICAN URBAN HISTORY 3 hours 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. Also listed as History 310.
312. URBAN POLITICS AND ADMINISTRATION 3 hours An examination of urban governments, the problems they face, and the growing importance of professional urban administrators. Analysis of current federal policy as it affects urban America.

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

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

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

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

348. AMERICAN CONSTITUTION I 3 hours 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. Also listed as History 348.

349. AMERICAN CONSTITUTION II 3 hours The adaptation of the original Constitution to twentieth century problems of economic regulation, civil rights, industrial liberation, the welfare state and the American Empire. Also listed as History 349.

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

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

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

363. PUBLIC ADMINISTRATION AND POLITICS 3 hours Bureaucrats as actors in the American political system. Their sources of power and their relationships to elected public officials. The problems of controlling bureaucracies.

364. PUBLIC MANAGEMENT AND ORGANIZATIONAL THEORY 3 hours The challenge of managing public bureaucracies effectively. The essentials of modern organization theory as a guide to meeting that challenge. The basics of personnel and budgetary administration.

366. PUBLIC OPINION AND INTEREST GROUPS 3 hours An examination of the characteristics of public opinion and interest groups, the relationship between them, and the role they play in American politics and policy making.

371. INTERNATIONAL RELATIONS 3 hours An examination of the forces which determine the policies of the nation states and their organizations in the international setting.

372. INTERGOVERNMENTAL RELATIONS 3 hours The evolving political relationship among federal, state, and local governments in the United States. The impact of intergovernmental relations on public policy. The federal grant-in-aid system and its impact on intergovernmental relations.

373. PUBLIC PERSONNEL ADMINISTRATION 3 hours The problems and practice of personnel administration in the public sector. The historical evolution of public personnel administration. The current and future role of public employee unions.

387. AMERICAN POLITICAL THOUGHT 3 hours An examination of American political theory commencing with the colonial period and proceeding to modern political thinkers. Also listed as History 387.
421. GOVERNMENT OF THE SOVIET UNION 3 hours 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.

422. FOREIGN POLICY OF THE SOVIET UNION 3 hours 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 hours 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 hours 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 hours 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 hours An examination of constitutional rights, due process and equal protection of the law in the United States. Particular emphasis on recent Supreme Court decisions regarding the rights of black Americans, freedom of expression and the rights of criminal defendants.

436. AMERICAN PUBLIC POLICY 3 hours 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. Emphasis on environmental policy and public welfare.

437. POLICY ANALYSIS-PROGRAM EVALUATION 3 hours A survey of the techniques utilized by public agencies and scholars to evaluate public problems and policy options (policy analysis), and then to evaluate the impact of the options adopted for solving such problems (program evaluation). Prerequisites: 123-142 and 143.

441. INTERNATIONAL LAW AND ORGANIZATIONS 3 hours An examination of the structure, operation and legal setting of international organizations, with particular emphasis on the United Nations as well as regional institutions such as the European Common Market.

443. ADMINISTRATIVE LAW 3 hours An examination of the internal bureaucratic judicial process, its relationship to the broader legal system and the changing attitudes of the Supreme Court toward administration rule making.

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

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

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

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

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

475. UNITED NATIONS TODAY 3 hours 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 departmen-
tal Model U.N. Committee are prerequisites for registering for this course. May be repeated three times for credit.

481. PUBLIC SERVICE INTERNSHIP PROGRAM 6-15 hours 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. Also listed as History 481.

491. SPECIAL TOPICS IN POLITICAL SCIENCE 1-3 hours

495. SEMINAR IN POLITICAL SCIENCE 1-3 hours

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

Public Administration
Specific requirements for the public administration major:
1. Political Science 105
2. Political Science 200
3. Political Science 201-202-203
4. Political Science 312
5. Political Science 363 and 364
6. Political Science 372 or 373 or 443
7. Political Science 436
8. Political Science 437
9. Math 130
10. Math 142-143
11. Economics 202 and 203
12. Economics 423
13. Electives (6 hours)

International Studies
Specific requirements for the International Studies major:
1. Political Science 200
2. Political Science 221, 222, 223, 224, 225 (any two)
3. Political Science 226
4. Political Science 371
5. Political Science 452
6. Economics 202-203
7. Economics 385 or 411
8. Political Science 334, 335, 336, 421, 422, 441, 475 (any five)

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.

Minor
Minor in History
History 110-111 3 hours
American History 211, 212, 213 9 hours
Contemporary Affairs 221, 222, 223, 224, 225, 226 3 hours
World History 6 hours
U.S. History 6 hours
Elective 3 hours
TOTAL 33 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
TOTAL 33 hours

Minor in Public Administration
Political Science 201-202-203
Political Science 363 and 364
Political Science 372 or 312 or 373
Political Science 436
Political Science 437 or 443
Economics 202-203, 423
Math 142-143

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

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

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

**Teacher Certification with Major in History or Political Science**

**History**
- Orientation 000 1 hour
- Western Civilization 110-111 6 hours
- History 200 1 hour
- American National Government 201, 202, 203 9 hours
- American History 211, 212, 213 9 hours
- Contemporary Affairs 221, 222, 223, 224, 225, 226 3 hours
- Non-Western History 6 hours
- European History 6 hours
- U.S. History 6 hours
- Electives* 12-15 hours
- TOTAL 56 hours

**Political Science**
- Orientation 1 hour
- Political Science 105 3 hours
- Political Science 200
- American History 211, 212, 213 9 hours
- American National Government 201, 202, 203 9 hours
- Contemporary Affairs 221, 222, 223, 224, 225 3 hours
- Theory 455 and 378, 456 or 457 6 hours
- American Politics 6 hours
- World Politics 6 hours
- Electives* 15 hours
- TOTAL 59 hours

*Must include courses in non-western history or political science.

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

The following electives taken in addition to the history or political science major qualify the student for certification in comprehensive social studies.

- Economics 100
- Economics 202
- Economics 203
- Geography 226
- Sociology 105
- Sociology 240 or 245
- Sociology 250

**Social Studies Electives:**
- 12 hours (the 12 hours of electives must all be taken in the same field, excluding the major—Political Science or History or Economics or Sociology.)
- Grand Total: 91 quarter hours.

In addition to the requirements for the major or social studies comprehensive and the general education requirements the student must complete the following courses in the Department of Education: Education 224, 250, or 251, 342, 370, 380, 450, 480-481.

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**INDUSTRIAL TECHNOLOGY (Department 142)**

Assistant Professors Devier (Chairman), Wright; Instructor Holloway.

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, and energy- and power-related fields. Course work and associated laboratory assignments place emphasis on researching, designing, experimenting, and fabricating.

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 from 66 to 69 depending upon the degree and 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 administration, computer science, design or a specially selected option/minor.

Two minors are also available in industrial technology: one of 45 credit hours for teacher certification, the other of 30 credit hours for industry bound students.

The department has developed an extensive program of field work involving visits to manufacturing centers, museums, and schools. Students are required to participate in at least one of 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** (67 hour major, option/minor and internship not included)

Orientation 000
Introduction to Industrial Technology 110
Industrial Materials and Processes I 130
Introduction to Drafting and Design 220
Construction Design 221
Product Design 222
Finishing Technology 230
Introduction to Graphic Communication 240
Computer Assisted Drafting and Design 324
Machining Technology 332
Casting Technology 333
Fabricating Technology 334
Introduction to Construction 350
Introduction to Energy/Power 360
Facility Planning 412
Industrial Materials and Processes II 430
Wood Product Manufacturing 431
Fundamentals of Electricity/Electronics 461
Quality Control and Work Measurement 470
Senior Project in Industrial Technology 495
American Tour of Industries 496

**Options/Minors** (30 hours)

An option or minor is required of all industrial technology-industry bound students. The five structured options to choose from are as follows:

**Management** (may be minor)
Accounting 131, 132, 133

**Business Law**
Business Law 322
Business Law 322
Principles of Management 330
Management Organizational Behavior 335
Personnel Management 363
Production & Operations Management 364
Electives in Management 9 hours

**Marketing** (may be minor)
Accounting 131, 132, 133
Marketing 351
Business Law 322
Managerial Finance 362
Industrial Marketing 376
Electives in Marketing 9 hours

**Design**
Advanced Graphic Communication 142-340
Technical Illustration 142-421
Creative Design 201-114
Drawing 151-151
Drawing 151-152
Design 151-161
Design 151-162
Graphic Design 151-222
Electives (nine hours taken from design related art, communication arts, industrial technology, or engineering courses).

Note: May be art minor if 30 hours of art are completed.

**Computer Science** (may be minor)
Introduction to Information Processing 130
Introduction to Fortran 131
Intermediate Programming 132
Assembly Language 234
Computer Organization 236
File Processing 238
Electives in Computer Science (6 hours 300-400 level)

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.

**Industrial Technology Minor (30 hours)**
Students from other disciplines who desire to gain a basic introduction to industry may select a minor as follows:

- Industrial Materials and Processes I 130
- Introduction to Drafting and Design 220
- Introduction to Graphic Communication 240
- Machining Technology 332
- Introduction to Construction 350
- Electives (minimum of nine hours credit) any course(s) selected from: 131, 200, 221, 222, 230, 260, 324, 333, 334, 340, 341, 360, 412, 421, 430, 431, 461, 470, 490, 495, 496, or 497.

**Industrial Arts Teacher 7-12 Certification Major (66 hours)**

- Orientation 000
- Introduction to Industrial Technology 110
- Industrial Materials and Processes I 130
- Introduction to Drafting and Design 220
- Construction Design 221
- Product Design 222
- Finishing Technology 230
- Introduction to Graphic Communication 240
- Machining Technology 332
- Casting Technology 333
- Fabricating Technology 334
- Introduction to Construction 350
- Introduction to Energy/Power 360
- Facility Planning 412
- Industrial Materials and Processes II 430
- Wood Product Manufacturing 431
- Fundamentals of Technology 461
- Organization and Methods of Teaching Industrial Technology 473
- Senior Project in Industrial Technology 495
- American Tour of Industries 496

All students pursuing certification must complete the following courses in the Department of Education: 100, 111, 150, 151, 224, 250 or 251, 260, 342, 370, 380, and 480. (Psychology 100 is also required and may be part of the BS-BA general education courses taken.)

**Industrial Arts Teacher K-12 Certification Major (69 hours)**

Same as 7-12 certification plus:
- Technology Education in the Elementary School 210
- Child Psychology 223 (Education)

**Industrial Arts Teacher 7-12 Certification Minor (45 hours)**

- Industrial Materials and Processes I 130
- Introduction to Drafting and Design 220
- Construction Design 221

Product Design 222
- Introduction to Graphic Communication 240
- Machining Technology 332
- Introduction to Construction 350
- Introduction to Energy/Power 360
- Wood Product Manufacturing 431
- Industrial Arts Organization & Methods 473

Electives (minimum of six hours any courses selected from: 110, 131, 200, 230, 260, 324, 333, 334, 340, 341, 412, 421, 430, 461, 490, 495, 496, or 497.

Complete all certification coursework as described above.

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**000. ORIENTATION 1 hour**

An introduction to the department, introduction to college life. Familiarization with the basic curriculums, 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 hours**

Introductory course for students majoring, minoring, 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. INDUSTRIAL MATERIALS AND PROCESSES 5 hours**

A study of major industrial materials and an introduction to the processes involved in their conversion from basic (raw) materials into industrial products, including metallic, polymeric, ceramic, wood, and various other materials, and the related refining and production utilized in the production of durable goods. (Formerly 460).

**131. CREATIVE CRAFTS 3 hours**

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

**200. TECHNOLOGY AND SOCIETY 3 hours**

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 3 hours
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 DRAFTING AND DESIGN 3 hours
An introduction to the technical drawing field and graphic representation in the design process. Consideration will be given to orthographic projections, pictorial drawings, and applied geometry. Initial consideration of the design process will be given. (Formerly 121).

221. CONSTRUCTION DESIGN 3 hours
Study of construction planning, design, engineering and layout. Basic residential planning, light construction principles, architectural details, plot surveying and layout, architectural working drawings, and related information. Prerequisite: 142220 or equivalent. (Formerly 122).

222. PRODUCT DESIGN 3 hours
Emphasis on an awareness of design as it is applied to fabrication using industrial materials. Study and practice in relating good design to application in the manufacturing of finished products. Prerequisite: 142-220 or equivalent. (Formerly 123).

230. FINISHING TECHNOLOGY 3 hours
Coverage of finishing materials and processes with all contemporary industrial applications; the study of coatings, treatments, methods of application and equipment, involved in the finishing of metals, plastics, wood products, ceramics, fabrics, and all other industrial materials. (Formerly 241).

240. INTRODUCTION TO GRAPHIC COMMUNICATIONS 3 hours
Study of the history of graphic reproduction, its present day procedures, and the machinery, equipment, and materials that are associated with it; including the fundamentals of graphic reproduction layout, design and composition, as well as relief, intaglio, lithography, screen and duplicating reproduction processes, binding, and finishing. (Formerly 311).

260. AUTOMOTIVE PREVENTATIVE MAINTENANCE 3 hours
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.

324. COMPUTER ASSISTED DRAFTING AND DESIGN 2 hours
This class will provide students with an introduction to CADD software and hardware systems. There will be laboratory experiences in both technical drawing and design applications including simulation of production processes. Prerequisite: 142-220 or equivalent.

332. MACHINING TECHNOLOGY 5 hours
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 TECHNOLOGY 3 hours
A study of pattern making, molding and pouring operations used in casting various materials. Casting techniques used will include investment, centrifugal, rotational molding, slip casting and others. Students will be exposed to casting non-ferrous metals, plastics and ceramics. (Formerly 313).

334. FABRICATING TECHNOLOGY 3 hours
A survey of the practices and principles of fabricating materials. Emphasis will be placed on various welding operations including electric and gas power units for metal, as well as plastics welding, metal, wood, plastic, ceramic, and other industrial material mechanical fasteners and adhesives. (Formerly 343).

340. ADVANCED GRAPHIC COMMUNICATIONS 3 hours
Study of advanced offset lithography processes including line and halftone 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: 142-240 or equivalent. (Formerly 322).

341. PHOTOGRAPHY 3 hours
Techniques of photographic composition, camera types, uses and accessories, photographic optics, and laboratory methods and materials; dark room developing and printing; color photography. (Formerly 330).
350. INTRODUCTION TO CONSTRUCTION 5 hours 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. (Formerly 353).

360. INTRODUCTION TO ENERGY/POWER 5 hours 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. (Formerly 451).

412. FACILITY PLANNING 3 hours Principles of facility planning, architectural features, selection, arrangement, and maintenance of equipment, organization of material flow and the nature of facility design will be covered. Both educational and industrial facilities will be considered.

421. TECHNICAL ILLUSTRATION 2 hours 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: 142-220 or equivalent.

430. INDUSTRIAL MATERIALS AND PROCESSES II 3 hours A general review of the materials and processes of industry. The course examines the processes; the associated application of procedures, materials, equipment and current practices of industry. Laboratory experiments and research projects are required. Prerequisite: 142-130 or equivalent. (Formerly 450).

431. WOOD PRODUCT MANUFACTURING 3 hours Machine operations in the manufacture of wood products will be covered. 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: 142-222 or equivalent. (Formerly 331).

461. FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS 5 hours 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. (Formerly 402).

470. QUALITY CONTROL AND WORK MEASUREMENT 3 hours 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 3 hours A professional course in the organization and methods of teaching industrial technology. The course will include philosophical constructs, organizing courses, program and course objectives, preparing lesson plans and industrial materials, laboratory procedures, and administrative practices. Students will also have the opportunity to conduct micro-teaching units. Course includes approximately 30 hours of field experience. Prerequisite: Students must have 30 hours or more of industrial technology courses.

484. INTERNSHIP IN INDUSTRIAL TECHNOLOGY 5-15 hours 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. A weekly seminar will be held.

490. SPECIAL TOPICS IN INDUSTRIAL TECHNOLOGY 1-3 hours

494. SEMINAR IN INDUSTRIAL TECHNOLOGY 1-3 hours

495. SENIOR PROJECT IN INDUSTRIAL TECHNOLOGY 3 hours Individual studies and investigations involving the application of knowledge to the solution of technical problems including research and development, testing, fabrication, assembly, and evaluation.
MATHEMATICS AND COMPUTER SCIENCE (Department 123)

Professors Berton, Lhamon; Associate Professors Childress (Chairman), R. Evans, Hovis, O’Dell, Putt, Shult, Spielman; Assistant Professor Retterer; Instructors Gregg, Roepke; Lecturers C. Lobenhofer, J. Ludanyi.

Mary Reichelderfer Chair of Mathematics and Computer Science established in 1983 from funds of the estate of Mary K. Werkman. The 1985-86 recipient of this chair is Dr. Conduff Childress, Associate Professor of Mathematics and Computer Science.

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 Division of Teacher Education 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 105 is designed to meet the needs of students who, although otherwise well-prepared for college work, require remedial work in mathematics before beginning the mathematics required for their chosen major. Because it is a remedial course it carries credit neither toward graduation nor toward any major or minor. It does, however, count in the student’s load, rank and GPA calculation. Entrance into Mathematics 105 is determined by the departmental placement test and requires permission of the department chairman. 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 computer programming should take either Introduction to Information Processing (CS 130), which is of general interest and includes programming in BASIC, or Introduction to Programming (CS 134), an introduction to programming via Pascal. 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.

Mathematics

For the mathematics major the student must complete the calculus sequence 163-261-262-263, Mathematics 272, 294, 311, 361, 452 and at least 14 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 10 additional hours of electives 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 131, 132, 133, 202, 203, and
000. **ORIENTATION** 1 hour Familiarization with the department, requirements for majors planning programs of study, University catalog and library. Required of departmental majors.

105. **INTERMEDIATE ALGEBRA** 3 hours 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 department placement exam indicates the need for a review of the fundamentals of algebra. Usually the student whose ACT is 15 or less should expect to take this course. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY. 3 hours Admission to this course is restricted by the placement examination and requires departmental approval.

120. **ELEMENTARY FUNCTIONS** 1 4 hours 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. (Formerly 161).

122. **ELEMENTARY FUNCTIONS** 2 3 hours Trigonometric functions, identities, solutions of triangles, complex numbers. Not open for credit to students who have received a grade of C or higher in Mathematics 163 or above. Prerequisite: 123-120 or its equivalent. (Formerly 162).

142. **PROBABILITY AND STATISTICS** 1 3 hours Descriptive statistics, probability, binomial distribution, normal distribution, confidence intervals, hypothesis testing. Prerequisite: 123-120 or equivalent.

143. **PROBABILITY AND STATISTICS** 2 3 hours 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: 123-142 or equivalent.

154. **CALCULUS AND PROBABILITY** 1 4 hours Differential and integral calculus involving algebraic and exponential functions; applications. Prerequisite: 123-120 or equivalent.

155. **CALCULUS AND PROBABILITY** 2 4 hours Differential and integral calculus of algebraic, logarithmic and exponential functions; applications, including basic probability theory. Prerequisite: 123-154 or equivalent.

156. **INTRODUCTORY DATA ANALYSIS** 4 hours Basic statistical techniques with emphasis on the applications to biological sciences. Prerequisite: 123-155 or equivalent.

163. **CALCULUS** 1 5 hours Limit of a function, continuity, the derivative, extrema, curve plotting, Mean Value Theorem, applications of the derivative, and the Fundamental Theorem of Calculus. Prerequisite: 123-120 and 122 or equivalents.

171. **MATHEMATICS FOR ELEMENTARY TEACHERS** 3 hours Problem solving skills and techniques. Introduction to mini and micro-computer programming; fundamentals of counting, probability, and statistics. OPEN ONLY TO ELEMENTARY EDUCATION MAJORS.

172. **FUNDAMENTAL MATHEMATICS** 1 3 hours 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 hours Geometric figures, transformations on the plane, geometric congruence, symmetry and similarity. OPEN ONLY TO ELEMENTARY EDUCATION MAJORS.

245. **HISTORY OF MATHEMATICS** 3 hours 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; next offered 1986-87.

261. **CALCULUS** 2 4 hours The algebra of vectors, integration techniques, applications of the integral, the exponential function, and inverse functions. Prerequisite: 123-163.

262. **CALCULUS** 3 4 hours Sequences and series, Taylor series, polar coordinates, parametric equations, conic sections, planes and lines in space. Prerequisite: 123-261.
263. CALCULUS 4 4 hours Vector-valued functions, multivariate functions, spherical and cylindrical coordinates, differential calculus of multivariate functions, integral calculus of multivariate functions. Prerequisite: 123-262.

272. INTRODUCTION TO LINEAR ALGEBRA 3 hours Vector space methods. Vector spaces over R, principally R to the nth power. Linear transformations, their matrices, eigenvalues and eigenvectors. Applications. Prerequisites: 123-262 or consent of the instructor.

290. SPECIAL TOPICS IN MATHEMATICS 1-3 hours

294. FOUNDATIONS OF MATHEMATICS 4 hours Introduction to sets, logic and mathematical proof; application of these concepts. Prerequisite: 123-261.

311. ABSTRACT ALGEBRA 1 3 hours Introduction to algebraic structures, groups, rings and fields. Prerequisite: 123-294. Offered alternate years; next offered 1986-87.

312. ABSTRACT ALGEBRA 2 3 hours Continuation of 311.

313. ADVANCED LINEAR ALGEBRA 3 hours Finite and infinite dimensional vector spaces over a field, linear transformations, inner product spaces, and canonical forms. Prerequisites: 123-272 and 311. Offered alternate years; next offered 1986-87.

324. TOPOLOGY 3 hours General point set topology and metric spaces. Prerequisites: 123-263 and 294. Offered alternate years; next offered 1987-88.

332. OPERATIONS RESEARCH 3 hours 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. (Also listed as Computer Science 332.) Prerequisite: 123-272.

336. DISCRETE MATHEMATICS 4 hours Introduction to and application of topics from mathematics relevant to computer science: combinatorics, relations, digraphs, trees, and elementary algebraic structures. Prerequisites: 123-135, 272 and 294.

361. DIFFERENTIAL EQUATIONS 5 hours First order differential equations with applications; second order linear differential equations with applications. Laplace transforms, systems of first order equations. Prerequisites: 123-262 and 272.


363. COMPLEX VARIABLES 4 hours Complex algebra, complex calculus, analytic functions, infinite series over the complex plane; theory of residues, conformal mapping. Prerequisite: 123-263. Offered alternate years; next offered 1986-87.

381. STATISTICS 1 3 hours Probability models, random variables, sampling estimation, hypotheses testing, non-parametric procedures, regression, and correlation. Prerequisite: 123-262.

382. STATISTICS 2 3 hours Continuation of 381.

390. SPECIAL TOPICS IN MATHEMATICS 1-3 hours

421. FOUNDATIONS OF GEOMETRY 1 3 hours Incidence, ordering, separation and congruence as they are involved in non-Euclidean geometries; incidence, affine and Euclidean geometries. Prerequisite: 123-294. Offered alternate years; next offered 1986-87.

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

423. PROJECTIVE GEOMETRY 3 hours Projectivities, perspective triangles, quadrangular sets, harmonic sets, duality, fundamental theorem and Pappus's Theorem, polarities, the conic, finite projective plane parallelism, coordinates. Prerequisite: 123-294. Offered alternate years; next offered 1986-87.

440. ADVANCED ENGINEERING MATHEMATICS 3 hours Vector analysis, Fourier series, functions from Rm to Rn, Taylor series of multivariable functions, and special functions. Applications. Prerequisite: 123-361. Offered alternate years; next offered 1987-88.

452. REAL ANALYSIS 1 3 hours Basic set theory, algebraic and topological properties of real Cartesian spaces, sequences. Prerequisites: 123-263 and 294. Offered alternate years; next offered 1987-88.
453. REAL ANALYSIS 2 3 hours Continuous functions in real Cartesian spaces, theory of functions of one variable (differentiation and integration). Prerequisite: 123-452. Offered alternate years; next offered 1987-88.

461. NUMERICAL ANALYSIS 1 4 hours Solutions of equations in one variable, interpolation and polynomial approximation, direct methods for solving linear systems. (Also listed as Computer Science 461.) Prerequisite: 123-230,262 and 272.

462. NUMERICAL ANALYSIS 2 3 hours Numerical differentiation and integration; initial value problems for ordinary differential equations; iterative techniques in matrix algebra. (Also listed as Computer Science 462.) Prerequisite: 123-361. Offered alternate years; next offered 1986-87.

490. SPECIAL TOPICS IN MATHEMATICS 1-3 hours

494. SEMINAR IN MATHEMATICS 1-3 hours

497. INDEPENDENT STUDY IN MATHEMATICS 1-3 hours

Computer Science
For the computer science major the student must complete the following computer science courses:
CS 134 Introduction to Programming
CS 135 Intermediate Programming
CS 138 Programming Environments
CS 234 Assembly Language Programming
CS 236 Introduction to Computer Organization
CB 238 Introduction to File Processing
CB 330 Organization of Programming Languages
CB 334 Operating Systems and Computer Architecture I
CS 338 Data Structures and Algorithm Analysis
CS 429 Senior Project Definition
CS 430 Senior Project
CS 434 Software Engineering
and one of the following sets of courses
Math 262 Calculus 3
CS 230 FORTRAN Programming
CS 461 Numerical Analysis I
or
CS 231 Introduction to COBOL
CS 331 Advanced COBOL
In addition, the student is required to complete 8 hours of computer science electives at the 300/400 level (Computer Graphics, 204-443 may be used as one of the courses in satisfying this requirement.) The computer science major must also complete the following cognates:

Mathematics Component
Math 163 Calculus 1
Math 261 Calculus 2
Math 272 Introduction to Linear Algebra
Math 294 Foundations of Mathematics
Math 336 Discrete Mathematics
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 381 Statistics 1
Math 382 Statistics 2

Science Component
At least two courses in biology and two courses in chemistry or physics with one year's work in one of the disciplines (the year's work must be one of the sequences:
Biology 100, 112, 113
Chemistry 171, 172, 173
Physics 231, 234, 232, 235, 233, 236
In addition the student must complete a year's work (at least 9 credit hours) in some discipline (the year's work must come from the required course list for a major or minor) in that discipline and must be beyond (in addition to) any courses used for the major requirement listed above or for general education).

For the computer science minor the student must complete CS 134, 135, 138, 234, 238, plus 10 hours of electives in computer science, at least six of which must be from among: CS 330, 331, 332, 334, 335, 338, ME 443 (or 444).

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

130. INTRODUCTION TO INFORMATION PROCESSING 4 hours 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 programming in BASIC.
134. INTRODUCTION TO PROGRAMMING 4 hours
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. Not open to students who have credit for 123-132.

135. INTERMEDIATE PROGRAMMING 4 hours
Continued development of discipline in program design, in style and expression, in debugging and testing, especially for larger programs. Introduction to algorithm analysis. Introduction to basic concepts of string processing, recursion, internal search/sort methods, and simple data structures. Not open to students who have credit for 123-132. Prerequisite: 123-134.

138. PROGRAMMING ENVIRONMENTS 4 hours
Introduction to software tools and operating system utilities available under popular operating systems such as UNIX. Introduction to the basic features of a system's programming language such as "C." Libraries of source and object code will be utilized. Prerequisite: 123-135.

230. FORTRAN PROGRAMMING 4 hours
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 123-131 or 201-122.

231. INTRODUCTION TO COBOL 4 hours
An introduction to programming in COBOL with business application.

234. ASSEMBLY LANGUAGE PROGRAMMING 4 hours
Introduction to computer structure and machine language, assembly language programming, macros, program segmentation and linkage. Prerequisite: 123-138.

236. INTRODUCTION TO COMPUTER ORGANIZATION 4 hours
Introduction to computer architecture; basic logic design. Prerequisite: 123-138.

238. INTRODUCTION TO FILE PROCESSING 4 hours
Introduction to file processing environment; sequential and direct access file manipulation techniques. Prerequisite: 123-138.

330. ORGANIZATION OF PROGRAMMING LANGUAGES 4 hours
Theoretical investigation of programming language constructs; illustration of construct implementation in popular programming languages. Prerequisite: 123-234.

331. ADVANCED COBOL 4 hours
Through the use of the COBOL programming language students are exposed to file organizations. They are introduced to advanced file processing techniques to the fundamentals of database management. Prerequisite: 123-231.

332. OPERATIONS RESEARCH 3 hours
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. (Also listed as Mathematics 332.) Prerequisite: 123-272.

334. OPERATING SYSTEMS AND COMPUTER ARCHITECTURE 1 4 hours
Operating system principles; organization and architecture of computer systems at the register-transfer and programming levels of system development. Prerequisite: 123-234 and 236.

335. OPERATING SYSTEMS AND COMPUTER ARCHITECTURE 2 4 hours
Continuation of 334. Prerequisite: 123-334. Offered alternate years; next offered 1985-86.

338. DATA STRUCTURES AND ALGORITHM ANALYSIS 4 hours
Basic techniques for the design and analysis of efficient algorithms for sorting, merging, searching and memory management. Prerequisite: 123-238.

429. SENIOR PROJECT DEFINITION 1 hour
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 123-430 Senior Project course.

430. SENIOR PROJECT IN COMPUTER SCIENCE 4 hours
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 hours
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 (Ada in 1985-86) will be developed.

**461. NUMERICAL ANALYSIS 1 4 hours**
Solution of equations in one variable; interpolation and polynomial approximation; direct methods for solution of linear systems. (Also listed as Mathematics 461.) Prerequisites: 123-230, 262 and 272.

**462. NUMERICAL ANALYSIS 2 3 hours**
Numerical differentiation and integration; initial value problems for ordinary differential equations; iterative techniques in matrix algebra. (Also listed as Mathematics 462.) Prerequisite: 123-361. Offered alternate years; next offered 1986-87.

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

**491. SPECIAL TOPICS IN COMPUTER SCIENCE 1-4 hours**

**495. SEMINAR IN COMPUTER SCIENCE**
1-4 hours

**498. INDEPENDENT STUDY IN COMPUTER SCIENCE 1-3 hours**

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**MUSIC (Department 152)**

Professor Sonntag; Associate Professor E. Williams (Chairman); Assistant Professors Fahner, Kratzer; Instructors Gray, Svendsen (on leave); Visiting Instructor Climer, Lecturers Biddinger, Hill, Laukhuf, D. Lennsen, Sherrick, Dyke, R. Williams.

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

Ohio Northern University is 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 and performance, 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).

All majors include a basic musicality core of courses: 121, 122, 123, 131, 132, 133, 211, 222, 223, 231, 232, 233, 241, 242, 311, 312, 313, 321, 322, 323, and 341. 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 classroom instruments; senior recital; music education courses 043, 336, 338, 339, 361, 461, and 462 (instrumental majors also take 463); and professional education courses 111, 223, 224, 250 or 251, 342, 370, 380, student teaching (one quarter), and field experience.

The **Bachelor of Music with a performance major** requires an acceptance audi-
tion, piano proficiency, 36 hours of applied private instruction, applied field literature, ensemble, music electives, and junior and senior recitals.

**Bachelor of Arts** The candidate for the Bachelor of Arts degree must complete the bachelor arts general education requirements listed earlier in this catalog. The major in music requires a minimum of 51 hours which must include music courses 121, 122, 123, 131, 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; and a senior project (with or without credit).

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. However, students on other programs may elect to fulfill requirements for music K-12, 7-12, or K-6 in addition to their regular curricula. Contact the department chair for specific requirements.

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

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 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.

010. VOICE CLASS 1 hour
015. VOICE-INDIVIDUAL 1-3 hours
020. PIANO CLASS 1 hour
021. PIANO CLASS - MAJORS 1 hour
025. PIANO-INDIVIDUAL 1-3 hours
026. HARPSCHORD-INDIVIDUAL 1-3 hours
030. ORGAN CLASS 1 hour
035. ORGAN-INDIVIDUAL 1-3 hours
040. STRINGS CLASS 1 hour
041. VIOLIN-VIOLA CLASS 1 hour
042. CELLO-BASS CLASS 1 hour
043. GUITAR/CLASSROOM INSTRUMENTS CLASS 1 hour
045. VIOLIN-INDIVIDUAL 1-3 hours
046. VIOLA-INDIVIDUAL 1-3 hours
047. CELLO-INDIVIDUAL 1-3 hours
048. DOUBLE BASS-INDIVIDUAL 1-3 hours
049. GUITAR-INDIVIDUAL 1-3 hours
050. WOODWIND CLASS 1 hour
055. FLUTE-INDIVIDUAL 1-3 hours
056. OBOE-INDIVIDUAL 1-3 hours
057. CLARINET-INDIVIDUAL 1-3 hours
058. BASSOON-INDIVIDUAL 1-3 hours
059. SAXOPHONE-INDIVIDUAL 1-3 hours
060. BRASS CLASS 1 hour
065. TRUMPET-INDIVIDUAL 1-3 hours
066. FRENCH HORN-INDIVIDUAL 1-3 hours
067. TROMBONE-INDIVIDUAL 1-3 hours
068. EUPHONIUM-INDIVIDUAL 1-3 hours
069. TUBA-INDIVIDUAL 1-3 hours
070. PERCUSSION CLASS 1 hour
075. PERCUSSION-INDIVIDUAL 1-3 hours

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

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

080. CHORUS 1 hour 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 hour A choral group open to all students for the study and performance of sacred and traditional music. The Chapel Choir sings at chapel services and gives occasional concerts.

082. VOCAL ENSEMBLE 1 hour Selected ensembles of vocalists for the study and performance of characteristic literature. Membership by audition.

083. UNIVERSITY SINGERS 1 hour A select group of men and women singers designed to perform a wide variety of choral literature with the highest musical standards. Performances include concerts and programs on and off campus and on tour. Membership by audition.

084. CONCERT BAND 1 hour A concert ensemble open to all qualified students who play band instruments. A wide variety of band literature is studied and performed in regular concert concerts.

086. PEP BAND 1 hour A band specially organized to provide music for athletic events.

087. SYMPHONIC BAND 1 hour A select, fully-instrumented concert ensemble studying and performing the finest band literature with the highest musical standards. Performances include concerts and programs on campus and tour concerts.

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

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

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

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

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

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

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

099. NEW MUSIC ENSEMBLE 1 hour 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.

Music Courses

000. ORIENTATION 1 hour Familiarization with the department, requirements for majors, planning programs of courses, university catalog and library. Required of departmental majors.
100. MUSIC 3 hours A basic course in the nature, forms, styles, and media of music of all types and periods. Emphasis upon listening and understanding. Laboratory listening and concert attendance, knowledge of fundamentals, recognition of composers and representative literature expected.

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

110. FUNDAMENTALS OF MUSIC FOR THE NON-MUSIC MAJOR 3 hours 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.

112. MUSIC FOR THE CLASSROOM TEACHER 3 hours Music activities, materials, literature, unit planning, teaching methods and skills for the classroom teacher, grades K-6. Prerequisite: Music 110. Includes approximately 5 hours of field experience.

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

122. THEORY OF MUSIC 3 hours Continuation of 121.

123. THEORY OF MUSIC 3 hours Continuation of 122.

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

132. EAR TRAINING 2 hour Continuation of 131.

133. EAR TRAINING 3 hour Continuation of 132.

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

211. INTRODUCTION TO ELECTRONIC MUSIC 2 hours 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 hours Continuation of Music 123. Study of 18th, 19th and 20th century compositional techniques. Development of analytical skills. Creative projects in composition. Continuation courses must be taken in sequence. Prerequisite: Music 123.

222. ADVANCED THEORY OF MUSIC 4 hours Continuation of 221.

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

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

232. ADVANCED EAR TRAINING 1 hour Continuation of 231.

233. ADVANCED EAR TRAINING 1 hour Continuation of 232.

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

242. BASIC CONDUCTING II 1 hour Continuation of 241.

261. LATIN AND ITALIAN DICTION FOR SINGERS 1 hour 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 hour Continuation of 261 in French.

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

310. AMERICAN MUSIC 3 hours 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 hours Polyphonic music in various styles with particular
emphases on that of the eighteenth century. Creative projects in contrapuntal writing. Prerequisite: Music 223.

312. FORM AND ANALYSIS 2 hours The evolution of musical forms and styles from the Baroque to the present. Theoretical and stylistic analysis of representative music. Prerequisite: Music 223.

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

314. MUSIC COMPOSITION 2 hours 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 hours The historical development of music literature. Study of representative literature and composers: Ancient, Medieval and Renaissance periods. Prerequisite: Music 100.

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

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

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

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

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

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

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

361. ELEMENTARY MUSIC METHODS (MUSIC EDUCATION MAJORS) 3 hours Philosophy, techniques, materials, curriculum planning for the elementary music teacher and supervisor. Includes approximately 8 hours of field experience.

371. APPLIED FIELD LITERATURE I 1 hour Study of the professional and educational literature in a specific applied field.

372. APPLIED FIELD LITERATURE II 1 hour Continuation of 371.

373. APPLIED FIELD LITERATURE III 1 hour Continuation of 372.

380. JUNIOR RECITAL 0 hours

461. SECONDARY CHORAL METHODS AND TECHNIQUES 3 hours Procedures in the development and direction of school choral groups, including choral literature of all types. Includes approximately 8 hours of field experience.

462. SECONDARY INSTRUMENTAL METHODS AND TECHNIQUES 3 hours Procedures in the development and direction of school bands and orchestras, including band literature of all types. Includes approximately 8 hours of field experience.

463. MARCHING BAND METHODS AND TECHNIQUES 2 hours Methods, materials, and techniques in the development and direction of the marching band. Show planning, precision drill, rehearsal techniques, and selection and rehearsal of music. Membership in Marching Band required in conjunction with class. Includes approximately 8 hours of field experience.

480. SENIOR RECITAL 0 hours

490. SPECIAL TOPICS IN MUSIC 1-3 hours Group study of approved special­ized topics not offered in catalog.

497. INDEPENDENT STUDY IN MUSIC 1-3 hours A wide variety of specialized musical subjects are available through individual study with a faculty member.
PHILOSOPHY AND RELIGION
(Department 115)

Professor Hinderliter (Chairman); Associate Professors Beanblossom, M. Lenssen; Instructor Plunkett.

Sara A. Ridenour Chair of Humanities established in 1983 from funds provided by Miss Florence G. Ridenour, A.B., 1918. The 1985-86 recipient of this chair is Dr. Harold Hinderliter, Professor of Philosophy and Religion.

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, 106, 107, or 108 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 (102, 237, 238), two courses in the history of philosophy (331, 343, 347, 371, 374), and either 494 or 497. A maximum of three courses in religion may be applied to the philosophy major. A senior comprehensive exam is not required.

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

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

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

Minor Programs Minors are offered in 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 chairman for further information about these programs.

Prelaw Program The department cooperates with the Pettit College of Law in the "guaranteed admission" prelaw program (see elsewhere in this catalog). Information about the curricular requirements of the program can be secured from the department chairman.

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

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

000. ORIENTATION 1 hour Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Also listed as Religion 000. Required of departmental majors.

100. PHILOSOPHY 3 hours An introduction to philosophical inquiry, its scope and methodology, through a study of representative philosophical problems such as the nature of ethical values, principles of correct reasoning, the possibility and limits of knowledge, and the distinction between appearance and reality.
102. GREAT PHILOSOPHERS 3 hours 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. Most of the following courses are offered in alternate years or on demand. Prerequisite for these courses, except 234: one course in philosophy or consent of instructor.

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

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

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

238. ETHICS 3 hours An examination of selected ethical theories and their rational justification. The use of ethical theories for resolving ethical issues in personal and social decision-making.

290. SPECIAL TOPICS IN PHILOSOPHY 1-3 hours

294. SEMINAR IN PHILOSOPHY 1-3 hours

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

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

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

334. SYMBOLIC LOGIC 3 hours The evaluation of deductive arguments by means of the formal procedures of modern symbolic logic. Prerequisite: 115-234.

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

339. BUSINESS ETHICS 3 hours 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.

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

343. AMERICAN PHILOSOPHY 3 hours (Formerly 444, 445). Main currents in American philosophy, including representative thinkers in such traditions as Puritanism, Transcendentalism, Pragmatism, and Realism.

345. EXISTENTIALISM 3 hours The historical roots of existentialism in Kierkegaard and Nietzsche, and the thought of representative writers such as Heidegger, Sartre, Marcel, Camus, Dostoyevsky, and Kafka.

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

371. MAJOR PHILOSOPHICAL MOVEMENTS 3 hours 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 hours 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.

490. SPECIAL TOPICS IN PHILOSOPHY 1-3 hours
494. SEMINAR IN PHILOSOPHY
1-3 hours

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

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

000. ORIENTATION 1 hour Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Also listed as Philosophy 000. Required of departmental majors.

105. RELIGION 3 hours An exploration of the religious dimension of man's search for personal identity, meaningful existence, and ultimate reality, through the examination of various aspects and expressions of the religious life of mankind.

106. INTRODUCTION TO THE BIBLE 3 hours An introduction to the Old and New Testaments, with special emphasis on the origin, history, and message of the biblical writings, and the central personalities, events, and ideas which form the basis of the Judeo-Christian tradition.

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

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

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

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

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

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

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

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

291. SPECIAL TOPICS IN RELIGION 1-3 hours

295. SEMINAR IN RELIGION 1-3 hours

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

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

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

353. REFORMATION AND MODERN CHRISTIANITY 3 hours The Protestant-Catholic conflict and the impact of modern secular thought on Christianity from the Reformation through the nineteenth century.
361. CONTEMPORARY CHRISTIAN THOUGHT 3 hours Basic issues, major theological positions, and representative theologians of twentieth century Christian thought.

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

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

491. SPECIAL TOPICS IN RELIGION 1-3 hours

495. SEMINAR IN RELIGION 1-3 hours

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

PHYSICS (Department 124)

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

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, 426. 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 chairman 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 chairman.

In addition to the major and minor in physics, the Department of Physics also offers a program leading to certification for teaching in the Ohio public schools. The program is designed for students whose goal is to teach physics in the high schools and will include 43 hours chosen to satisfy Ohio State certification requirements and to a limited extent the personal interests of the student. Although some flexibility is permitted, the courses taken in this program are chosen in consultation with the chairman of the Department of Physics and will depend upon the completion of any necessary prerequisites.

This program differs from the major in physics in that the student desiring certification for teaching must also be registered in the Department of Education and satisfy all requirements as determined by the State of Ohio and the Department of Education of Ohio Northern University. A detailed description of these requirements can be obtained from the chairman of the Department of Education.
000. ORIENTATION 1 hour Familiarization with the department, requirements for majors’ programs, University catalog and library. Required of departmental majors. Offered every year in the Fall Term.

100. PHYSICS 3 hours 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 hour Reading, discussion and reports on problems of historical and current interest in physics. Offered only when sufficient interest warrants.

Physics 211, 212 and 213 are non-calculus, general physics courses intended primarily for pharmacy and secondary education students. Prerequisites: Mathematics 161, 162 or equivalent.

211. GENERAL PHYSICS: MECHANICS OF SOLIDS AND FLUIDS 3 hours Basic principles of Newtonian mechanics of solids and liquids. The laboratory corresponding to this course is Physics 234. Offered every year in the Fall Term.

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

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

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

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

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

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

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

235. PHYSICS LABORATORY: HEAT, SOUND, AND LIGHT 1 hour Experiments in heat, sound and light. Physics 232 should be taken concurrently, or instructor’s permission must be obtained. Offered every year in the Fall and Winter Terms.

236. PHYSICS LABORATORY: ELECTRICITY AND MAGNETISM 1 hour Experiments with basic electrical and magnetic phenomena. Physics 233 should be taken concurrently or instructor’s permission must be obtained. Offered every year in the Spring Term.

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

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

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

303. MODERN PHYSICS 3 hours The concepts of relativity, quantum and wave mechanics, atomic structure and absorption and emission processes. Prerequisites: Mathematics 264 and Physics 233. Offered every year in the Winter Term.
310. THEORY AND ADVANCED LABORATORY: MECHANICS 1-3 hours
Prerequisite: One year of physics. Part of the Physics major program and offered when needed.

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

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

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

351. ANALYTICAL MECHANICS I 3 hours
Vector analysis, kinematics, conservative forces, planetary motion, pendulum, free and forced oscillations, coupled systems and normal coordinates, angular momentum, rigid bodies. Prerequisites: Mathematics 361 and Physics 233. Part of the Physics major program and offered when needed.

352. ANALYTICAL MECHANICS II 3 hours
LaGrange equations, canonical formulation, principle of least action, normal coordinates, rigid bodies, special relativity, mathematical methods. Prerequisites: Mathematics 362 and Physics 351. Part of the Physics major program and offered when needed.

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

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

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

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

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

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

432. STATISTICAL PHYSICS 3 hours

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

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

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

PHYSICS 113
PSYCHOLOGY, SOCIOLOGY, AND SOCIAL WORK (Department 133)

Professors Cohoe, Wildman (Chairman); Associate Professors Brubaker, Compton, P. Hruschka; Instructor Pion-Berlin; Lecturers Houshwer, Selby.

The objectives of the department are to develop within each student an understanding of human relationships, institutions, and social processes; familiarity with the nature and causes of social problems; acquaintance with the theories of behavior; ability to think more critically and to integrate insights for useful participation in community life; and preparation for advanced study in the individual's selected field.

Prelaw with Psychology, Sociology, Social Work, or Gerontology Study in the behavioral sciences provides an especially suitable background for prelaw students. The department, in cooperation with the College of Law at Ohio Northern University, offers a formal prelaw program with "guaranteed admission" to the law school.

To qualify for guaranteed admission students must complete the program with at least a 3.30 GPA. The program requires specially selected electives. Specific curricular requirements are available from the department chairman.

Secondary Certification Secondary teacher certification programs are offered in social psychology, sociology, and comprehensive social studies. Information on these programs is available from the department chairman or the Office of the Director of Teacher Education.

Course Numbering Code To simplify identification of courses in the department the following numbering code is used:
1st Digit—Level (1st year, 2nd year, etc.)
2nd Two digits—discipline:
0—multi-discipline (except for 100,105)
10's, 20's, 30's—psychology
40's, 50's—sociology
60's—gerontology
70's, 80's—social work
90's—special topics, independent study

Examples:
141—1st year, sociology
335—3rd year, psychology
270—2nd year, social work

Field Work, Externships 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 100
6. Math 142

For the major
1. Psychology 000
2. The Psychology Core
3. 32 hours of Psychology Electives
4. Biology 113 & 231 or 2 approved mathematics courses

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

000. ORIENTATION 1 hour Familiarization with the departmental requirements for majors, planning programs of courses, University catalog and library; career options. Also listed as Sociology 000 and Social Work 000.

100. PSYCHOLOGY 4 hours General research and concepts in human behavior. Lectures, demonstrations, and observations.

111. INTRODUCTORY LABORATORY 2 hours Experiments which demonstrate basic psychological principles and acquaint the student with laboratory procedures and report writing. Usually to be taken concurrently with Psychology 100, but can be taken later. Required for Psychology majors, optional for other students enrolled in Psychology 100.

190. SPECIAL TOPICS IN PSYCHOLOGY 1-3 hours
200. PRACTICUM IN CHILD DEVELOPMENT 1 hour Work with children in the department's Child Development Center under supervision of an instructor and nursery school teacher. Practical experience in behavior management. Prerequisite: Approval of department chairman.

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

211. EXPERIMENTAL PSYCHOLOGY II 4 hours Continuation of 210.

212. PRINCIPLES OF BEHAVIOR MANAGEMENT 3 hours The theory and supporting research which underlie behavior modification. Taught through lecture and laboratory demonstrations. Prerequisite: Psychology 100.

215. DEVELOPMENTAL PSYCHOLOGY 3 hours Basic theories in human development from conception through old age; contemporary research at each age level. Prerequisite: Psychology 100.

218. PSYCHOLOGY OF THE EXCEPTIONAL CHILD 3 hours The study of the atypical child. Prerequisite: Psychology 100.

226. HUMAN SEXUAL BEHAVIOR 3 hours The course will draw heavily on the literature in an attempt to provide students with an understanding of what is known (as well as what is not known) about the major facets of the human sexual behavior. Prerequisite: Psychology 100.

290. SPECIAL TOPICS IN PSYCHOLOGY 3 hours

300. PRACTICUM IN TEACHING IN THE BEHAVIORAL SCIENCES 2 hours Specialized teaching experiences in courses in the department and preparation of demonstrations. May be repeated to 6 hours but does not apply to major requirements. Also listed as Sociology 300 and Social Work 300. Prerequisites: Psychology 212 and approval of the chairman.

301. SOCIAL PSYCHOLOGY 4 hours The effect of social and cultural forces upon the individual. The nature and development of attitudes, languages, cognitive processes, individual and group projects illustrative of the methodology of social psychology. Also listed as Sociology 301. Prerequisite: Psychology 100.

303. ADVANCED SOCIAL PSYCHOLOGY 3 hours Advanced study of competing perspectives in social psychology. Special emphasis on symbolic interactionist perspectives and "sociological" social psychology. Topics include interpersonal interaction, small group behavior, socialization, sex roles and the "self" in society. Also listed as Sociology 303. Prerequisite: Psychology 301 (Sociology 301).

304. PRACTICUM IN RESEARCH IN THE BEHAVIORAL SCIENCES 1-3 hours Assist and participate in ongoing research by faculty members within the department. May be repeated up to 6 hours but repeated hours do not apply to major or graduation requirements. Also listed as Sociology 304 & Social Work 304. Prerequisites: Psychology 111 or 202 and approval of the chairman.

305. ADULT DEVELOPMENT AND AGING 3 hours A study of the basic psychological processes in adult development and aging with an emphasis on a dynamic view of human development throughout the life span. Heavily oriented towards research methods and experimental findings. Prerequisite: Psychology 215.

310. THEORIES OF LEARNING 3 hours Major theories of learning, their origins and relevance in the light of current research and findings. Prerequisite: Psychology 212.

311. PSYCHOLOGY OF PERSONALITY 4 hours The major theories of personality from Freud to contemporary theoretical approaches. Prerequisite: Psychology 100.

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

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

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

335. PHYSIOLOGICAL PSYCHOLOGY
3 hours Psychology as a biological science. Physiological events underlying behavior, including sensory, neural, and glandular involvement in such topics as motivation, emotion, and learning. Prerequisite: Psychology 100 and Biology 231 or 331.

336. SENSATION AND PERCEPTION
3 hours A study of sensory systems. Demonstration and evaluation of selected experiments in visual, auditory, gustatory, olfactory, and cutaneous perception. Prerequisites: Psychology 100 and Biology 231 or 331.

337. COMPARATIVE PSYCHOLOGY
3 hours Survey of behavior of different phyletic levels from lower forms to man with special emphasis on primate behavior. Prerequisites: Psychology 100 and Biology 100.

338. BRAIN AND BEHAVIOR
3 hours A survey of the brain systems involved in anxiety, arousal, depression, schizophrenia, etc. Consideration will also be given to the behavioral and neurophysiological effects of various psychoactive drugs. Prerequisite: Psychology 335 and Biology 231 or 331.

390. SPECIAL TOPICS IN PSYCHOLOGY 1-3 hours

411. COUNSELING PSYCHOLOGY
3 hours Basic methods of counseling plus a study of seven models for counseling intervention. Prerequisites: Psychology 311 or 420.

420. ABNORMAL PSYCHOLOGY I

421. ABNORMAL PSYCHOLOGY II
3 hours A review of the causes, diagnosis and treatment of schizophrenic disorders, paranoid disorders, disorders of impulse control, psychosexual disorders, personality disorders, organic mental disorders, and a survey of multiaxial diagnostic procedures and therapeutic techniques used in clinical psychology. Prerequisite: Psychology 100.

424. PRACTICUM IN COUNSELING PSYCHOLOGY
3 hours Work with patients in a clinical setting under supervision, practical experience in interviewing and administering routine psychological tests. May be repeated once. Prerequisite: Approval of instructor.

426. PRACTICUM IN PSYCHOLOGY
6-15 hours A field experience in the area of psychology. Open to seniors. Prerequisite: Approval of chairman.

434. HISTORY AND SYSTEMS OF PSYCHOLOGY
3 hours An overview of the major lines of thinking which have influenced the field of psychology beginning with the ancient Greek philosopher-scientist up to the twentieth century. Emphasis is given to theories of Empiricism, Associationism, and Scientific Materialism as well as twentieth century schools of psychological thought.

490. SPECIAL TOPICS IN PSYCHOLOGY 1-3 hours

494. SEMINAR IN PSYCHOLOGY
3 hours Open to seniors.

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

Sociology
A major in sociology consists of the following requirements:
1. Sociology 000
2. Sociology 105
3. Sociology 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 Sociological Association Outstanding students with sophomore or junior standing are encouraged to participate in this special program of independent study. In the first phase of the program, each student reads independently during the summer on a selected topic. In the second phase, the student attends the annual meeting of the American Sociological Association to hear reports of current research, to attend business sessions of the Association, and to learn about career opportunities in sociology. In the third phase, the student writes a paper on the topic of the summer reading and submits other reports on the activities at the annual meeting. Each student completing the program earns five hours of transferable credit from the University of Central Florida, the home institution of the coordinators of the program. Further information and applications can be secured from the ONU sociology faculty.

000. ORIENTATION 1 hour Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Also listed as Psychology 000 and Social Work 000.

105. SOCIOLOGY 3 hours Introduction to the basic phenomena and processes of social life: culture, socialization, deviance, social institutions (family, polity, economy, education, religion, military), bureaucratization, social inequality, collective behavior, social movements, and population. Analysis of the interplay between the person and social groups.

141. SOCIAL PROBLEMS 3 hours An analysis of cultural values and institutional arrangements as the origins of social problems. Inflation, unemployment, poverty, racism, and sexism are some of the topics covered. Prerequisite: Sociology 105.

191. SPECIAL TOPICS IN SOCIOLOGY 1-3 hours

203. MINORITY RELATIONS 3 hours A study of the dynamics of minority-majority relations within American society, and of the characteristics, conditions, and problems of several minority groups, as defined by race, ethnicity, or sex. A significant component is individually tailored by the student to his professional goals. Also listed as Social Work 203. Prerequisite: Sociology 105.

240. MARRIAGE AND THE FAMILY 3 hours An institutional perspective on the family, patterns of courting, marital parental behavior, trends in the contemporary American family. Prerequisite: Sociology 105.

241. SEX ROLE SOCIALIZATION 3 hours Attention is focused on the roles of men and women in the society with particular emphasis on the social forces that shape boys and girls into adult men and women. Other major issues are also addressed. Prerequisite: Sociology 105.

243. SOCIAL DEVIANCY 3 hours Sociological perspectives on the processes of individual and group deviance, a discussion of selected major forms of deviance, their causes, processes, and consequences. Prerequisite: Sociology 105.

245. ORGANIZATIONAL BEHAVIOR 3 hours Theories, methods, and data in the sociological analysis of complex organizations (corporations, social agencies, hospitals, armies, labor unions, schools, governments, prisons, philanthropies, political parties.) Prerequisite: Sociology 105.

246. WORK AND OCCUPATIONS 3 hours Size and distribution of the labor force; social life in the various particular occupations and types of occupations; occupational careers, including education and training for work; relationships between occupations and the rest of the social structure. Prerequisite: Sociology 105.

247. SOCIAL INEQUALITY 3 hours The variety of stratification systems; status attainment, social mobility, and social immobility; detailed descriptions of life among the poor, rich and middle classes in America and elsewhere. Prerequisite: Sociology 105.

250. CULTURAL ANTHROPOLOGY 3 hours An introduction to the major concepts and principles of cultural anthropology. Cultural anthropology emphasizes the understanding of the total configuration and interrelationships of culture traits, complexes, and
social relationships in a particular geographic environment and historical context. Prerequisite: Sociology 105.

251. QUANTITATIVE METHODS IN BEHAVIORAL RESEARCH 4 hours Applications in the behavioral sciences of several sampling distributions (binomial, normal, Student's t, Chi square, F. and certain distributions used in "nonparametric tests") as well as correlation and regression. Major emphasis on testing behaviorally meaningful hypotheses. Prerequisite: Mathematics 142. Offered alternate years; will be offered 1984-85. (Formerly 201).

252. QUALITATIVE METHODS IN BEHAVIORAL RESEARCH 4 hours Survey of major research techniques, including participant and non-participant observation, interview, questionnaire, use of available data, and experiment. Other topics include sampling and establishing causality in non-experimental research. Prerequisite: Sociology 105. Offered alternate years, will be offered in 1985-86.

291. SPECIAL TOPICS IN SOCIOLOGY 1-3 hours

300. PRACTICUM IN TEACHING IN THE BEHAVIORAL SCIENCES 2 hours Specially planned teaching experiences in courses in the department, including tutoring, curriculum development and preparation of demonstrations. Prerequisite: Psychology 212 and approval of the chairman. May be repeated to 6 hours. The course does not apply to major requirements. Also listed as Psychology 300 and Social Work 300.

301. SOCIAL PSYCHOLOGY 4 hours The effect of social and cultural forces upon the individual. The nature and development of attitudes, languages, and cognitive processes. Individual and group projects illustrating the methodology of social psychology. Also listed as Psychology 301. Prerequisite: Sociology 105.

302. GERONTOLOGY 3 hours A study of the psychological, physiological and social aspects of the lives of our elderly citizens, with a special emphasis upon the environmental problems which confront them. Prerequisites: Psychology 100 or Sociology 105. Also listed as Social Work 302.

303. ADVANCED SOCIAL PSYCHOLOGY 3 hours Advanced study of competing perspectives in social psychology. Special emphasis on symbolic interactionist perspectives and "sociological" social psychology. Topics include interpersonal interaction, small group behavior, socialization, sex roles and the "self" in society. Also listed as Psychology 303. Prerequisite: Sociology 301 (Psychology 301).

304. PRACTICUM IN RESEARCH IN THE BEHAVIORAL SCIENCES 1-3 hours Assist and participate in ongoing research by faculty members within the department. Prerequisite: Sociology 202 and approval of the chairman. May be repeated up to 6 hours but repeated hours do not apply to major or graduation requirements. Also listed as Psychology 304 and Social Work 304.

340. URBAN SOCIOLOGY 3 hours 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: Sociology 105.

341. POPULATION 3 hours Size, composition, distribution and growth of human populations; theories of population growth and migrations; collection and use of U.S. Census and other censuses; population explosions, birth control and abortion. Prerequisite: Sociology 105.

345. COLLECTIVE BEHAVIOR 3 hours Sociological analysis of fads and fashions, the formation of public opinion, the nature of crowds (and how and why they may become riots), and the development of social movements (Black power, women's lib, etc.) Prerequisite: Sociology 105.

347. CRIME AND DELINQUENCY 3 hours Sociological analysis of major forms of crime and juvenile delinquency, theories, research methods, data and implications for control. Prerequisite: Sociology 105.

348. MEDICAL SOCIOLOGY 3 hours Social interaction between patient and physicians, nurses, pharmacists, and other healthcare personnel; social interaction among those personnel; social definition of illness; societal response to illness; social epidemiology; education and training of medical personnel. Prerequisite: Sociology 105.

118 SOCIAL WORK
352. SOCIAL DEVIANCE II: SEMINAR 3 hours Advanced study, including considerable independent study, of topics covered in Social Deviance I. Special emphasis on competing theories of deviance and on very recent research. Prerequisite: Prerequisite: Sociology 243.

391. SPECIAL TOPICS IN SOCIOLOGY 1-3 hours

446. SOCIAL THOUGHT 4 hours Traces sociological theorizing from sociology's historical origins through the classical and contemporary periods. Important theorists covered include Karl Marx, Emile Durkeim, Max Weber, George Herbert Mead, Talcott Parsons. Emphasis is placed on comparing and contrasting the major theoretical perspectives which provide the foundation for a scientific study of social life. Prerequisite: Sociology 105.

491. SPECIAL TOPICS IN SOCIOLOGY 1-3 hours

498. INDEPENDENT STUDY IN SOCIOLOGY 1-3 hours Prerequisite: Approval of chairman.

Social Work
A major in social work consists of the following requirements:
1. 000 Orientation
2. 203 Minority Relations
3. 280 Introduction to Social Welfare
4. 281 Introduction to Social Work
5. 285 Human Behavior and the Social Environment
6. 366 Social Work Intervention I
7. 367 Social Work Intervention II
8. 368 Social Work Intervention III
9. 369 Services Planning
10. 470 Social Work Pro-seminar I
11. 471 Social Work and the Law
12. 474 Social Work Research
13. 480 Social Welfare Policy
14. 484 Social Work Pro-seminar II
15. 485 Field Experience
16. 486 Field Experience Seminar
17. 6 hours of social work electives
18. Math 142
19. Biology 113
20. Introduction to Information Processing 130
21. Political Science 202 and 203
22. Psychology 100 and 215
23. Sociology 105

000. ORIENTATION 1 hour Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Also listed as Psychology 000 and Sociology 000.

170. CAREERS IN SOCIAL WORK 1 hour An overview of the numerous settings of social work practice including services to children, medical social services, public welfare, mental health, and aging. Also describes social service administration, social policy development, and research.

192. SPECIAL TOPICS IN SOCIAL WORK 1-3 hours

203. MINORITY RELATIONS 3 hours A study of the dynamics of minority-majority relations within American society, and of the characteristics, conditions, and problems of several minority groups, as defined by race, ethnicity, or sex. A significant component is individually tailored by the student to his professional goals. Also listed as Sociology 203.

241. SEX ROLE SOCIALIZATION 3 hours Attention is focused on the roles of men and women in the society with particular emphasis on the social forces that shape boys and girls into adult men and women. Other major issues are also addressed. Prerequisite: Sociology 105

280. INTRODUCTION TO SOCIAL WELFARE 3 hours (Formerly 271). A survey of the historical development of social welfare in the United States; its roots in the English poor laws; emphasis on the description of current program and policy.

281. INTRODUCTION TO SOCIAL WORK 3 hours (Formerly 270). An introduction to the profession of social work, the scope of services and methods, and issues in the development of the profession.

285. HUMAN BEHAVIOR-SOCIAL ENVIRONMENT 3 hours (Formerly 272). This course draws upon selected general education knowledge of the social sciences related to human functioning within the social environment, to offer the student an integrated knowledge base for social work practice. The focus will be upon developmental, interactional, and adaption processes within a systems framework. Prerequisite: Social Work 280 or 281.

292. SPECIAL TOPICS IN SOCIAL WORK 1-3 hours
300. PRACTICUM IN TEACHING IN THE BEHAVIORAL SCIENCES 2 hours Specialy planned teaching experiences in courses in the department, including tutoring, curriculum development and preparation of demonstrations. May be repeated to 6 hours but does not apply to major requirements. Also listed as Psychology 300 and Sociology 300. Prerequisite: Psychology 212 and approval of the chairman.

302. GERONTOLOGY 3 hours A study of the psychological, physiological and sociological aspects of the lives of our elderly citizens, with a special emphasis upon the environmental problems which confront them. Prerequisite: Psychology 100 or Sociology 105. Also listed as Sociology 302.

304. PRACTICUM IN RESEARCH IN THE BEHAVIORAL SCIENCES 1-3 hours Assist and participate in ongoing research by faculty members within the department. Prerequisite: Permission of instructor and approval of the chairman. May be repeated up to 6 hours but repeated hours do not apply to major or graduation requirements. Also listed as Psychology 304 and Sociology 304.

366. SOCIAL WORK INTERVENTION I 6 hours Social work practice, model and process; individual needs assessment; developing and implementing service plans; use of communications techniques including interviewing, identification of formal and informal resources; beginning practice evaluation. Includes 8 hours per week in a practice setting.

367. SOCIAL WORK INTERVENTION II 6 hours Introduction to the use of small group techniques as an aid to personal, small group, and environmental change. Concurrently the student performs a structured field experience in a social service agency. Eight clock hours in a social service agency.

368. SOCIAL WORK INTERVENTION III 3 hours Further development of social work methodology. Focus on developing skills in macro-intervention through a supervised group project to assess design, and build a social program in a nearby community. Prerequisite: Social Work 367.

369. SOCIAL WELFARE ADMINISTRATION: SERVICES PLANNING 3 hours (Formerly 373). Within a systems perspective, skill development in the use of techniques of describing, reporting, and measuring client and target population characteristics, services, resources; use of information in decision making to allocate scarce resources among competing demands in an uncertain environment. Prerequisite: Social Work 368.

375. CHILD WELFARE 3 hours A look at the needs of children and at services offering them protection, placement, and care. Also includes study of the history and policies of child welfare programs. Prerequisite: Social Work 281.

385. SERVICES TO FAMILIES 3 hours A study of problems in family development and functioning from a family systems perspective, with focus upon the service programs and interventive approaches to helping families. Prerequisite: Social Work 281.

392. SPECIAL TOPICS IN SOCIAL WORK 1-3 hours

401. AGING AND MENTAL HEALTH 3 hours An introduction to the mental and behavioral disorders of the elderly; the policies and programs which address these disorders; and a focus on research related techniques of management and treatment of the elderly with disorders. Prerequisites: Gerontology 202, 302; Social Work 280; Psychology 305. Also listed as Gerontology 401.

470. SOCIAL WORK PROSEMINAR I 1 hour An introduction to field experience; an investigation of the range of services provided by the public and private agencies which are available for field placement; and an emphasis on induction into the work setting. Prerequisite: Social work major with senior standing.

471. INTRODUCTION TO LAW FOR SOCIAL WORKERS 3 hours A summary of legal processes and statutes relevant to social welfare and social work practice issues. Prerequisite: Social Work 368.

474. SOCIAL WORK RESEARCH 4 hours An introduction to the basic research techniques of problem formulation, design, data analysis, and interpretation as they apply to social work practice. The computer is utilized as a fundamental research tool. The critiquing and utilization of research knowledge in practice and the evaluation of one's own practice are emphasized. Prerequisite: Social Work 369.

475. SOCIAL SERVICES IN MENTAL HEALTH 3 hours A study of the history, policy, and organization of the mental health services in the United States. Special empha-
sis is given to multiple interpretations of mentally disordered behavior and maintenance of the chronically disabled in the community. Prerequisite: Social Work 281.

480. SOCIAL WELFARE POLICY 3 hours
An analytical and case study approach to the examination of national social welfare policy and program within the context of basic political and governmental processes. A special focus is given to the analysis of income maintenance policy and program. Prerequisites: Political Science 105, 203; Social Work 368.

484. SOCIAL WORK PROSEMINAR II
1 hour Continuation of 470. Student develops learning strategies and evidences for each competency in cooperation with the field instructor, under faculty supervision.

485. FIELD EXPERIENCE IN SOCIAL WORK 15 hours (Formerly 472). Placement in a social agency five days each week (36 hours) throughout the quarter to provide experience in social work practice under qualified agency instruction-supervision; including responsibility for direct social work services to clients. Emphasis is on application of theory and knowledge in developing professional practice skills in the helping process with individuals, families, and client and community groups. Campus seminars are held concurrently to assist the student to integrate field work with classroom learning. To be taken concurrently with Social Work 486.

486. SEMINAR IN SOCIAL WORK
2 hours (Formerly 496). Discussion and analysis of the field setting, practice and organization. Includes monitoring and evaluation of the student competencies. To be taken concurrently with Social Work 485.

492. SPECIAL TOPICS IN SOCIAL WORK 1-3 hours

499. INDEPENDENT STUDY IN SOCIAL WORK 1-3 hours Prerequisite: Approval of chairman.

Gerontology
A major in gerontology consists of the following requirements:
1. Gerontology 000
2. Gerontology 202
3. Gerontology 302
4. Gerontology 305
5. Gerontology 393
6. Gerontology 401
7. Gerontology 493
8. Gerontology 499
9. Psychology 100
10. Psychology 215
11. Sociology 105
12. Sociology 348
13. Social Work 280
14. Social Work 369
15. Biology—Physiology of Aging
16. Philosophy—Death and Dying or Bioethics

A minor in gerontology consists of the following requirements:
1. Psychology 100
2. Sociology 105
3. Developmental Psychology 215
4. Introduction to Social Welfare 280
5. Gerontology 302
6. Adult Development in Aging 305
7. Aging and Mental Health 401
8. Agency Experience and Observation 489
9. Independent Study - Working with Aged 499

000. ORIENTATION 1 hour Familiarization with the departmental requirements for majors, planning programs or courses, University catalog and library; career options. Also listed as Psychology 000, Sociology 000 and Social Work 000.

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

302. GERONTOLOGY 3 hours A study of the psychological, physiological and sociological aspects of the lives of our elderly citizens, with a special emphasis upon the environmental problems which confront them. Also listed as Sociology 302 and Social Work 302. Prerequisite: Psychology 100 or Sociology 105.

305. ADULT DEVELOPMENT AND AGING 3 hours A study of the basic psychological processes in adult development and aging with and emphasis on a dynamic view of human development throughout the life span. Heavily oriented towards research methods and experimental findings. Also listed as Psychology 305. Prerequisite: Psychology 215.
393. SPECIAL TOPICS IN GERONTOLOGY 1-3 hours

401. AGING AND MENTAL HEALTH
3 hours An introduction to the mental and behavioral disorders of the elderly; the policies and programs which address those disorders and a focus on research related to techniques of management and treatment of the elderly with disorders. Also listed as Social Work 401. Prerequisites: Gerontology 202, 302; Social Work 280; Psychology 305.

489. AGENCY OBSERVATION AND EXPERIENCE 6 hours A field experience in the area of Gerontology. Prerequisite: Approval of chairman.

493. SPECIAL TOPICS IN GERONTOLOGY 1-3 hours
THE COLLEGE OF
Business Administration

Kenneth Cooper, Dean

The College of Business Administration

Professors Painter, Young; Associate Professors Goldberg, Meininger (Sabbatical), D. Moore, Scheppf; Assistant Professors Ewing, Logsdon, Savino; Instructors Lyons, Rogers, Schiefer, Schmitz, Templeton.

On February 4, 1978, the Ohio Northern University Board of Trustees authorized a College of Business Administration and requested the President of the University to implement steps and procedures in establishing this new academic unit.

The College of Business Administration has as its nucleus the former Department of Business and Economics, which had existed for many decades as a segment of the College of Arts and Sciences. The new College of Business Administration became fully operational on September 1, 1978, and has been authorized to award the degree of Bachelor of Science in Business Administration.

The George Willard Patton Chair of Economics, endowed by the Richard King Mellon Charitable Trust of Pittsburgh, Pennsylvania, has been established beginning with the academic year 1973-74. The current year's recipient of this endowed professorship is Dr. Roger Goldberg, Professor of Economics.

Objectives

The College of Business Administration through its several major areas of study seeks to develop a basic understanding of the theories and principles of business administration and economics as they apply to our modern economic system and the organization and management of contemporary business enterprises. Students are afforded the opportunity to major in the five disciplines as authorized by the faculty: accounting, economics, finance, management, and marketing.

Admissions Standards

Candidates seeking admission to the College of Business Administration are required to meet the general requirements for admission to the University. The College of Business Administration accepts high school graduates who have 16 acceptable units of high school credits. Twelve of these units are prescribed as follows: Four units of English; two 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 that the student is eligible to return to his/her former institution.

The Bachelor of Science In Business Administration Degree Programs

General and Advanced Courses

The first two years of study are usually devoted to the student's general education. These courses furnish the foundation and background for advanced education. Work in the student's major is mostly taken on the advanced level, along with advanced electives.
General Education Requirements
The following lists the prescribed general education courses required of all students.

**Fine Arts:**
1. One course from among Art 100, Music 100 or Theatre 105
2. Speech 100 plus two approved speech electives

**Humanities:**
1. English 110, 111, and one other English course
2. Philosophy 100 or 234 or 237 or 238
3. Religion 105 or 106 or 107 or 108

**Social Sciences:**
Western Civilization 110, 111 and one other Social Science Division course

**Mathematics and Natural Sciences:**
1. Computer Science 130
2. Mathematics 142 and 143
3. A laboratory science course

**Health and Physical Education:**
Three hours of physical education service courses
Additionally 15 elective hours (18 for economics majors) are required in the Arts and Sciences College.

**Business Administration Requirements**
The following courses are required of all business majors: Orientation 000; Principles of Accounting 131, 132, 133; Economics 100; Microeconomics 202; Macroeconomics 203; Business Law 322; Managerial Finance 362.

**Specific Majors and Major Courses Required**

**Accounting:** Intermediate Accounting 301, 302, 303; Cost Accounting 311, 312, 313; plus 12 hours of upper division accounting electives; Management 330 and Marketing 351.

**Economics:** Mathematics 120, 122; Money and Banking 352; Intermediate Microeconomics and Macroeconomics 383 and 384; plus 18 hours of upper division economics electives.

**Finance:** Cost Accounting 311; Money and Banking 352; Business Law 323; Management 330; Marketing 351; Finance 354, 368, 374, 461, 463 and 421 (or nine hours of upper division CBA electives).

**Management:** Management 330; Marketing 351; Money and Banking 352; Personnel Management 363; Business Policies and Central Management 485 and 12 hours of upper division management electives.

**Marketing:** Marketing 351; Management 330; Money and Banking 352; Salesmanship 371; Advertising 372; Logistics 373; Merchandising 375; Marketing Research 434; Advanced Marketing 451 and six hours of upper division marketing electives.

**Minors**
The minors shown below are available only to non-business majors. (A "C" grade or better is required in all courses.)

**Accounting Minor:** Accounting 131, 132, 133, 301, 302, 303, 311, 312, 313 and an approved accounting elective.

**Economics Minor:** Economics 100, 202, 203, 383, 384 and 15 hours of approved economics electives.

**Finance Minor:** Accounting 131, 132, 133, 311, Economics 352, Finance 354, 362 and nine hours of approved finance electives.

**Management Minor:** Accounting 131, 132, 133, Business Law 322, Finance 362, Management 330, Economics 100 and 12 hours of approved management electives.

**Marketing Minor:** Accounting 131, 132, 133, Marketing 351, Finance 362, Business Law 322, Economics 100 and 12 hours of approved marketing 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 courses for the specific major(s).
5. A minimum 2.00 grade point average.
6. A letter grade of "C" or better in all courses specified in (2) and (3) above.

**General Regulations of the College of Business Administration**

1. A student may not register for more than 19 hours of academic course work without the dean's written approval. A normal pro-
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 term.
3. A student indicates his/her major choice by completing a declaration of major form available in the Office of the Dean. Faculty advisers assist the student in the planning of his/her major.
4. No course, taken in the College of Business Administration, for which the student receives a letter grade of "D" or less is acceptable toward the requirements of the major(s).
5. Generally, 100-200-300- and 400-level courses are to be taken by freshmen, sophomores, juniors and seniors respectively.
6. Each student enrolled in the College of Business Administration is expected to make consistent progress toward completion of the degree requirements of his/her major(s).
7. With the written permission of the instructor and the dean, course prerequisites may be waived.
8. Except where noted in the course descriptions, credit hours earned in repeated courses may be counted only once in the total hours required for graduation.
9. 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 term on an S/U option basis, with the following stipulations:
1. The student must be registered full time in the College of Business Administration.
2. The student must have sophomore, junior, senior, or post graduate standing.
3. The requested course cannot be in the College of Business Administration except those specified as S/U in course descriptions.
4. The course cannot be a 100-level general education course.
5. The requested course cannot be a cognate.
6. The grade of "S" is to be equated with A, B, C, and the grade of "U" is equated with D or F. S/U grades are not computed in the accumulative grade point average.
7. The student cannot change the grading option after the second week of classes.

Classification of Students For purposes of classification, the minimum requirements for sophomore standing are 45 quarter hours of completed academic work; for junior standing 90 quarter hours; 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 the student's participation in extra-curricular activities is reviewed by the Vice President of Student Affairs and by the dean of the college.

Any student on probation whose work for the following quarter continues below 2.00 will have his/her record reviewed by the Academic Qualifications and Scholarship Committee of the College and may be recommended to the dean for suspension or dismissal from the University.

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

Students in the prelaw program select a major and complete the necessary requirements as do other students. There is a "prelaw core" comprised of 36 hours of courses to be taken outside the major.

Prelaw students need a 3.30 GPA overall to qualify for automatic admission to the Ohio Northern University College of Law. Students cannot take prelaw core courses on a S-U option basis.

The prelaw option is also available to transfer students from accredited four-year colleges and for students who hold an associate degree from an accredited junior college. Transfer students who successfully complete the prelaw program, have had at least 90 quarter hours at ONU and graduate with a 3.40 accumulative grade point average will also automatically be admitted to the ONU College of Law. The Dean and the faculty of the College of Business Administration believe that the prelaw program offers an excellent opportunity for superior students preparing for a career in the legal profession.
Additional information is available through the Office of the Dean.

Small Business Institute and Internship Programs The College of Business Administration offers a limited number of enrollment spaces for upper-class students in both the Small Business Institute and Internship Programs. These options are intended to expose selected students to contract case studies and approved academic internships for a maximum of 15 quarter hours of academic credits. Details of both programs are available through the Office of the Dean.

General Courses

000. ORIENTATION / CAREER DEVELOPMENT AND SEARCH 1 hour 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.

200. PERSONAL FINANCIAL MANAGEMENT 3 hours A systematic, goal-oriented framework for personal money management. Attention is given to the respective roles of budgeting, banking relationships, insurance programs, and investments in developing and maintaining the comprehensive financial plan. The application of sound decision models and accurate record keeping within the family unit is emphasized. Not open to Finance majors or students with credit in 500-461 or 500-463.

201. PERSONAL COMPUTER APPLICATIONS FOR BUSINESS 3 hours Business applications for microcomputers. Introductory level use of software for wordprocessing, file management, spreadsheets, and graphics. Prerequisite: 500-133.

322. BUSINESS LAW I 3 hours Introduction to the legal system, including criminal law, torts (civil liability), and contract law.

323. BUSINESS LAW II 3 hours Negotiable instruments, and business associations (the legal rights, responsibilities of agents, partnerships, and corporations). Prerequisite: 500-322.

344. STATISTICAL TECHNIQUES IN ECONOMICS 3 hours Develops analytical tools in probability, and probability distributions, estimation and hypothesis testing, Bayesian analysis, game theory and sampling techniques, with appropriate examples. Prerequisite: 123-142 and 143. Offered alternate even-numbered years.

391. BUSINESS COMMUNICATIONS 3 hours The techniques of writing business letters and reports; efficient and accurate communication of economic and business facts, presentation of conclusions for management decision-making and further study of English for selfimprovement. Prerequisites: 112-107, 108, 109 or 112-110, 111.

475. SMALL BUSINESS INSTITUTE 3 hours A team of students is assigned to work with a small business. Supervision is provided by a faculty member. A confidential and professional relationship is maintained between the team and the client business. Course is graded S or U. May be repeated up to 9 hours. Restricted enrollment. Offered Fall and Spring quarters. Prerequisite: Permission of Director.

Accounting


132. PRINCIPLES OF ACCOUNTING II 3 hours Accounting reports for internal users of financial information. Methods of analysis underlying the provision of accounting information. Basic theory of the reporting model. Prerequisite: CBA majors a grade of C or better in Accounting 131.

133. PRINCIPLES OF ACCOUNTING III 3 hours Uses of accounting data to support management decision-making and control of business operations, determination of costs and cost behavior. Specialized application areas of accounting. Prerequisite: CBA majors a grade of C or better in Accounting 132.

292. SPECIAL TOPICS IN ACCOUNTING 1-3 hours

301. INTERMEDIATE ACCOUNTING I 3 hours Financial accounting functions and basic theory. Preparation of financial statements and actuarial methods. Current assets and current liabilities. Prerequisite: 500-132.

302. INTERMEDIATE ACCOUNTING II 3 hours Plant assets, long-term liabilities, stockholder's equity, dilutive securities and investments. Prerequisite: 500-301.
303. INTERMEDIATE ACCOUNTING III

311. COST ACCOUNTING I 3 hours
Emphasis on accounting for manufacturing. Controls for material, labor, and overhead cost accounting. Job order and process costing systems. Prerequisite: 500-133.

312. COST ACCOUNTING II 3 hours Flexible budgets and cost behavior pattern analysis. Standard costs and variance analysis. Direct costing and responsibility accounting for management reporting. Prerequisite: 500-311.

313. COST ACCOUNTING III 3 hours
Accounting for internal management. Quantitative techniques including simulation based upon computerized data. Prerequisite: 500-312.

387. TAXATION OF INDIVIDUALS
3 hours 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: 500-133 or permission of instructor.

388. TAXATION OF PROPERTY TRANSACTIONS AND CORPORATIONS
3 hours 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: 500-387.

389. TAXATION OF S CORPORATIONS, PARTNERSHIPS, ESTATE & GIFTS
3 hours 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: 500-388.

392. FUND ACCOUNTING 3 hours
Accounting, budgeting, and financial reporting by units of government and institutional organizations. Authoritative standards relevant to not-for-profit entities. Prerequisite: 500-301.

393. BUSINESS COMBINATIONS
3 hours Accounting for mergers, consolidations, subsidiary acquisitions. Preparation of consolidated statements. Intercompany sales and debt; parent company investment accounting; subsidiary equity transactions. Prerequisite: 500-302.

403. AUDITING I 3 hours Auditing concepts and standards; procedure for independent verification of data and the review of operations; working papers; professional ethics and legal liability of auditors. Prerequisite: 500-303.

404. AUDITING II 3 hours Statistical sampling; methods for evidence gathering and evaluation; audits of electronic systems; internal and external audit reports; current developments affecting auditing practice. Prerequisite: 500-403.

427. INTERNSHIP IN ACCOUNTING
1-15 hours Field experience in accounting. Consult advisor. Course graded S or U.

477. CPA PROBLEMS I 3 hours (Formerly 500-472). A comprehensive review of the application of accounting principles, using specific problems from CPA examinations, and the development of approaches to problem solving. Topics covered include working capital, inventory, plant assets, deferred taxes, stockholder's equity, present value, and inflation accounting. Prerequisite: 500-303. Course graded S or U.

478. CPA PROBLEMS II 3 hours (Formerly 473). Topics covered include partnerships, investments, consolidations, cost accounting, quantitative methods and non-profit accounting. Course graded S or U. Prerequisites: 500-303 and 313.

479. CPA PROBLEMS III 3 hours Similar to Accounting 477 and 478. Topics covered include auditing (professional responsibilities, internal control, evidence, reports, statistical sampling and EDP); income taxes (individual, transactions in property, and corporate); and current accounting literature. Course graded S or U. Prerequisites 500-303, 387 and 403.

492. SPECIAL TOPICS IN ACCOUNTING
1-3 hours

496. SEMINAR IN ACCOUNTING
1-3 hours

499. INDEPENDENT STUDY IN ACCOUNTING 1-3 hours 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.

Economics

100. ECONOMICS 3 hours The origins, characteristics, and functions of our economic organization, current institutional arrangements, the use of appropriate tools of economic analysis; relevant economic and social goals.

202. PRINCIPLES OF MICROECONOMICS 3 hours Economics of the individual firm in the free market economy; competitive and monopolistic markets. How prices ration goods and services to users, and the principles on which the total product is divided among the owners of the factors of production. Actual cases from business. Prerequisite: for CBA majors a grade of C or better in 500-100.

203. PRINCIPLES OF MACROECONOMICS 3 hours Forces that determine the behavior of national income and output, unemployment, and the price level. Rudiments of money and banking, monetary and fiscal policy, growth and development. Selected issues of contemporary social relevance. Prerequisite: CBA majors a grade of C or better in 500-100.

273. ENERGY ECONOMICS 3 hours An analysis of the major issues of the energy problem: recent experiences, current problems, and future prospects for each energy source; demand restraints, energy conservation, tradeoffs between energy supply and environmental protection; energy research, and the development of major policy issues; points of view of producers, consumers, and government are presented. Prerequisite: 500-100.

290. SPECIAL TOPICS IN ECONOMICS 1-3 hours

341. LABOR ECONOMICS 3 hours Labor as a factor in production; labor mobility; theories of the determination of wages, and bargaining theory; history and methods of labor unions, and government are presented. Prerequisite: 500-202 and 203.

348. URBAN ECONOMICS 3 hours Topics covered will include definitions of urban places and regions; origins of cities; local public finance; economics of urban housing; urban transportation; economics of crime and pollution, poverty and discrimination. Prerequisites: 500-202 and 203. Offered alternate even-numbered years.

352. MONEY AND BANKING 3 hours Theories of money and credit; commercial banking practices; reserve banking; monetary and banking laws; money market; money and credit in the world economy. Prerequisites: 500-202 and 203.

383. INTERMEDIATE MICROECONOMIC THEORY 3 hours Special problems of pricing, production, and distribution under perfect competition, oligopoly, duopoly, and monopoly in the American economy. Prerequisites: 500-202 and 203.

384. INTERMEDIATE MACROECONOMIC THEORY 3 hours The principles, measurement, analysis, and control of aggregate economic activity; the role of consumption, investment, and saving in achieving full employment output, economic growth and price stability. Prerequisites: 500-202 and 203.

385. INTERNATIONAL ECONOMICS 3 hours Theories and current problems of trade between nations; governmental restrictions and controls; the importance of multilateral trade, balance of payments; scarce resources; population, and employment trends. Prerequisites: 500-202 and 203. Offered alternate odd-numbered years.

411. COMPARATIVE ECONOMIC SYSTEMS 3 hours A comparative study of capitalism, socialism, and communism with emphasis on the economics of pricing, production, and distribution under these systems. A specific and empirical examination of these systems in actual use as in the United States, Russia, Great Britain, and China. Prerequisites: 500-202 and 203. Offered alternate even-numbered years.

423. ECONOMICS OF THE PUBLIC SECTOR 3 hours Topics include the federal budget; public good analysis, public debt issues; evaluation of tax sources for the federal, state, and local government levels; and inter-governmental fiscal relationships. Prerequisites: 500-202 and 203.
426. INTERNSHIP IN ECONOMICS
1-15 hours Field experience in economics. Consult advisor. Course graded S or U.

442. ECONOMIC HISTORY OF THE UNITED STATES 3 hours Economic life in colonial America and the east-west migration; the development of modern business and industry in the United States; the corporation and its part in the nation's growth; the causes and consequences of the Great Depression. Prerequisites: 500-202 and 203. Offered alternate even-numbered years.

443. HISTORY OF ECONOMIC THOUGHT 3 hours The development of economic thought from Greek and Hebrew writers to modern economists; Adam Smith, Malthus, Ricardo, Marx, Marshall, Keynes, and modern economists. Prerequisites: 500-202 and 203.

480. SEMINAR IN ECONOMICS 1-3 hours

490. SPECIAL TOPICS IN ECONOMICS 1-3 hours

497. INDEPENDENT STUDY IN ECONOMICS 1-3 hours 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.

Finance

354. FINANCIAL INSTITUTIONS 3 hours Managerial policies and decision making concepts of commercial banks, savings and loan associations, mutual savings banks, and other financial institutions. Prerequisites: 500-133, 202 and 203.

362. MANAGERIAL FINANCE 3 hours 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. Prerequisite: 500-100 and 133.

368. FINANCIAL PLANNING AND WORKING CAPITAL MANAGEMENT 3 hours 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: 500-362.

374. CAPITAL INVESTMENTS AND FINANCIAL DECISIONS 3 hours 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: 500-362.

421. INTERNSHIP IN FINANCE
1-15 hours Field experience in finance. Consult advisor. Course graded S or U.

461. INVESTMENTS 3 hours 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: 500-362.

463. RISK AND INSURANCE 3 hours 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: 500-362 and junior standing.

494. SPECIAL TOPICS IN FINANCE 1-3 hours

500. INDEPENDENT STUDY IN FINANCE 1-3 hours 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.

Management

291. SPECIAL TOPICS IN MANAGEMENT 1-3 hours

325. MANAGEMENT/LABOR-LAW 3 hours The relationship of management and labor under existing laws including such areas as labor organizational drives, union representation elections, strikes, boycotts, picketing, collective bargaining, arbitration, and fair labor standards. Prerequisite: 500-322.
330. PRINCIPLES OF MANAGEMENT
3 hours The organization of firms. Modern management methods, decision making processes, procedures, physical equipment and standards. Organization and managerial relationships of major industrial functions.

335. MANAGEMENT ORGANIZATIONAL BEHAVIOR 3 hours A study of the human factors in organizations. Emphasis placed on the contributions of the behavioral sciences to the inner workings of business firms. Topics covered are historical foundations, motivation, job satisfaction, bureaucratic structures, leadership and its development, group dynamics, social issues, communication, and international organizational behavior. Prerequisite: 500-330.

363. HUMAN RESOURCE MANAGEMENT 3 hours 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: 500-330.

364. PRODUCTION AND OPERATIONS MANAGEMENT 3 hours An introduction to the major issues and analytical problem solving techniques existing in the field of production and operations management. Prerequisites: 500-362 and 330; 123-143 or 155; and junior standing.

365. HUMAN RELATIONS IN BUSINESS 3 hours A study of the importance of human relationships in business and the primary role of attitudes in determining the success or failure of an enterprise. Emphasis is given to case studies, supplemented with textual materials and visual presentations depicting contemporary work situations faced by workers and managers. Prerequisite: 500-330.

410. BUSINESS AND SOCIETY 3 hours Analysis of the complex and dynamic interrelationships between business and society through a study of the social, cultural, legal, ethical, economic and technological issues, philosophies and points of view which influence business. Topics discussed will include corporate responsibility, individual rights and multi-national business. Prerequisites: 500-330 and 363.

425. INTERNSHIP IN MANAGEMENT
1-15 hours Field experience in management. Consult advisor. Course graded S or U.

474. SMALL BUSINESS MANAGEMENT
3 hours A survey of the importance of small business, its current status, problems encountered and requirements for successful operations. Emphasis being given to problem solving techniques for small businesses. Prerequisites: 500-322, 330, 351, and 362; and 123-143 or 155.

485. BUSINESS POLICIES AND CENTRAL MANAGEMENT 3 hours Senior seminar designed to provide the student with a greater awareness of the business enterprise as a whole and of the total circumstances faced by management at all levels in a variety of types of firms. Presented on a case study basis and designed for the application of advanced analytical problems solving techniques. Prerequisites: 500-322, 202, 203, 330, 351, and 362.

491. SPECIAL TOPICS IN MANAGEMENT 1-3 hours

495. SEMINAR IN MANAGEMENT
3 hours

498. INDEPENDENT STUDY IN MANAGEMENT/MARKETING 1-3 hours
An exploration in depth of a subject of special interest to both the student and the faculty member. Hours by arrangement. Prerequisites: Junior standing and approval of the instructor. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the college prior to registration.

Marketing

351. MARKETING 3 hours Management-oriented; concepts, processes, and problems of marketing; channels of distribution, marketing research, brands and price policies.

371. SALESMANSHIP 3 hours The principles, techniques and problems of salesmanship, sales management, recruiting, controlling and evaluating a sales force; marketing research techniques, pricing and contemporary channels of distribution. Prerequisite: 500-351.

372. ADVERTISING 3 hours Advertising as an integral part of the marketing process; selling appeals and types of advertising; consideration of copy and media; problems of publishing and broadcast advertising. Prerequisite: 500-351.
373. LOGISTICS 3 hours Water, railway, highway, pipeline and air transportation and their development in the U.S.; rates and their effect on location and development of industry; government regulations; and labor relations. Prerequisites: 500-330 and 351.

375. RETAIL MERCHANDISING 3 hours 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: 500-351.

376. INDUSTRIAL MARKETING 3 hours A study of the basic industrial marketing system as distinguished from consumer marketing. The demand for industrial goods and the nature of the consumer is analyzed in detail. Topics discussed will include characteristics of manufacturer’s goods, channels of distribution, pricing, vendor and value analysis, industrial buying, industrial advertising and meeting product specifications. Prerequisite: 500-351.

420. INTERNSHIP IN MARKETING 1-15 hours Field experience in marketing. Consult advisor. Course graded S or U.

434. MARKETING RESEARCH 3 hours Research design, data collection methods, sampling techniques, tabulation and analysis of information concerning problems in marketing. Prerequisite: 500-351.

451. ADVANCED MARKETING 3 hours Marketing decision making, interacting with the various functions of marketing to better develop marketing strategies by defining target markets and constructing marketing mixes. Prerequisites: 500-351, 375, 434, 330, and 362; senior standing.

452. SEMINAR IN MARKETING 3 hours Readings in marketing pertaining to case histories and current situations. Prerequisite: 500-351.

493. SPECIAL TOPICS IN MARKETING 1-3 hours

498. INDEPENDENT STUDY IN MANAGEMENT/MARKETING 1-3 hours An exploration in depth of a subject of special interest to both the student and the faculty member. Hours by arrangement. Prerequisites: Junior standing and approval of the instructor. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the college prior to registration.
Academic Accreditation and Association
The Accreditation Board for Engineering and Technology (ABET), previously known as the Engineers' Council for Professional Development, the only official accrediting agency for engineering curricula, has accredited all of the curricula in the College including the departments of civil, electrical, and mechanical engineering. The College is a member of the American Society for Engineering Education and is recognized by the Ohio Board of Registration for Professional Engineers and Surveyors.

Objectives
The College attempts to teach its students to think in a logical sequence given certain facts. The College follows the objectives of the University in developing the student as a whole individual who will be successful and creative in their profession as well as in their personal life. In the College students attain the highest undergraduate proficiency in subject matter basic to all engineering and in the essentials of their chosen branch of the engineering profession.

History and Tradition
In 1871 the first catalog of the University included a course in surveying. A department of Civil Engineering was organized in 1880 with its first graduate in 1882, Electrical Engineering in 1898, and Mechanical Engineering in 1904. Over 3,000 engineers have graduated from the Thomas Jefferson Smull College of Engineering in its 104-year history. These departments continue to meet the highest standards of engineering excellence.

The tradition of the College is to treat each student as an individual, to keep class size at a minimum, and to maintain a close faculty-student relationship.

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 1985-86 recipient is Dr. Bruce Johansen, Professor of Electrical Engineering.

Engineering Alumni Chair established in 1983 by donations from engineering alumni and friends in celebration of the College's Centennial year. The 1985-86 recipient of the chair is Dr. Kanti Shah, Professor of Civil Engineering.

Leroy H. Lytle Distinguished Chair of Mechanical Engineering established in 1983 from the estate of Leroy H. Lytle, 1923 graduate of ONU. The 1985-86 recipient of the chair is Dr. Leo Maier, Associate Professor of Mechanical Engineering.

Dr. Merlyne F. Spotts Engineering Lecture Fund. Established by Dr. Merlyne F. Spotts, Engineering ME '23, DE '81. The income from the fund is used each year to bring a prominent speaker to the campus to speak on Engineering topics and/or on matters that might affect present and future engineers.

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 and be of good moral character. Ten of these units are as follows: 4 units in English; 4 units in mathematics (2 units in algebra, 1 unit in geometry, and at least ½ unit in trigonometry or its equivalent); and 2 units in science (1 unit in physics and preferably 1 unit in chemistry). The College recommends but does not require that applicants have two units of a foreign language.

Students who meet the admission standards of the University but are deficient in the mathematics or physics requirements of the College will be required to make up their deficiency. The College recommends that prospective students make up their high school deficiencies before entering as freshmen. An additional summer quarter or even a fifth year may be necessary for those students who do not meet this requirement before they enter as freshmen.

Transfer students from other accredited universities or colleges may be admitted with advance standing if they have an honorable dismissal and are eligible to return to the universities or colleges they previously attended. Transfer students who conceal their previous college attendance will have their admission to the College revoked. The College will not accept from transfer students more than 150 quarter hours or their equivalent. Transfer work must be "C" or better.

The dean admits special students who are non-degree candidates if, after a personal interview, it is determined that they are sufficiently prepared to pursue engineering courses successfully.

Academic Loads
Each department in the College lists quarter by quarter the standard course load for a student. The normal maximum load is that which is listed by the department for that quarter at that level or 19 hours whichever is largest. The dean, upon recommendation of the student’s adviser, may permit a student to enroll for extra hours. The normal requirement is an accumulative average of at least 3.00/4.00. Each engineering student is responsible for fulfilling the requirements for the current year’s catalog as they apply to that year of the program.

Academic Status
A student is in good academic standing when the accumulative grade point average is at least 2.00 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. Students may be on probation two successive quarters if conditions and evidence indicate that the student is improving academically.

Students who consistently attain a low accumulative average (below 2.00) or extremely low scholarship in a given quarter are subject to suspension, which implies the possibility of readmission at a later date, usually after three quarters.

Students having academic difficulty are required to meet frequently with their adviser. A student on probation is not eligible to participate in extra-curricular activities. The dean makes some exceptions based upon the recommendation of the student’s adviser and the director of the activity. The dean treats each student on probation individually. It is the obligation of the student on probation to initiate the petition process for regaining eligibility to participate in extra-curricular activities.

Classification
The traditional designations of freshman, sophomore, junior, and senior are used by the College. The engineering curricula are vertical insofar as most courses are taken in sequence. The level at which a student is studying is far more consequential than the hours accumulated or the years spent in school. Each student is required to complete designated courses before advancing to the next student classification. In general, the classification doesn’t change during the year once it has been determined at the start of the year.

Graduation and Degrees
A student qualifies for graduation by meeting specific course requirements as listed in the catalog year by year for the specific program at specific levels and by earning a minimum of 200 academic hours. In addition a student also needs a scholarship rating of at least two quality points for each credit hour scheduled.
with an accumulative grade point average of 2.00 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.

Registration as a Professional Engineer
Registration as a Professional Engineer by the state, necessary for professional practice, requires licensing examinations and four years of experience after completing the bachelor of science degree. The dean gives full information to students in their freshman and senior years. Students may also write the Secretary of the Board of Registration for Professional Engineers, 65 South Front Street, Room 302, Columbus, OH 43215.

Engineering Graduates and Law School
Graduating seniors of the Thomas Jefferson Smull College of Engineering with at least a 3.3/4.0 accumulative average who wish to enter the Pettit College of Law at Ohio Northern University are admitted automatically. However, the Law School Admission Test (LSAT) is required.

The Robert W. Biggs Engineering Building
The College occupied its present facility in 1971. Located in this 1.8 million dollar structure are 91 rooms including classrooms, laboratories, computer center, and faculty offices. The addition of the Robert W. Biggs Engineering Building to the campus completed the science complex on what has come to be known as the West Campus.

Pre-Engineering Curricula
Since the first two years of any particular curriculum in engineering at many universities are practically the same, the College offers pre-engineering in most fields. The pre-engineering curricula are flexible enough to conform to the catalog requirements of the university the student has chosen to attend after completing the pre-engineering program. All pre-engineering students are enrolled in the College of Engineering and have an adviser on the engineering faculty.

Arts-Engineering Curricula
Superior students may qualify to pursue the arts-engineering program. Students are admitted to both the College of Arts and Sciences and the College of Engineering and 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 program is that a student is free to major in any arts and sciences area and in any branch of engineering. A student who desires to work in a foreign country or for an American company in a foreign country may major in the appropriate foreign language. The superior student enrolled in the arts-engineering program will come to understand more fully the role of the humanities and civilization in a scientific and engineering world; and his service to mankind will increase. He will also help create a broader image of the engineer in our age.

Basic Engineering
No sharp line of distinction is drawn in the fundamental education of civil, electrical, or mechanical engineers for the reason that the sciences basic to engineering—mathematics, physics, chemistry, and the engineering sciences—are essential in all branches of engineering. Since certain courses in engineering are considered to be fundamental and deal with the basics of the several fields, they are used by all three departments in at least the first two years of the curriculum. The basic courses are taught by the engineering faculty and are required of all engineering students.

Interdisciplinary Programs
In addition to the regular degree programs in civil, electrical, and mechanical engineering, two interdisciplinary programs have been developed. One is an Option in Business Administration while the other is a Minor in Computer Science. The programs work equally well with any of the three degree programs.

This is accomplished by proper planning and judicious use of social sciences 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 disciplinary 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 chairman 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, Introduction to File Processing and one upper level computer science elective.

### ALL ENGINEERING—CLASS OF 1989

**Sophomore 1986-87**

<table>
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<tr>
<th>Course</th>
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<tr>
<td>Calculus 4, Linear Algebra, Differential Equations (123263-272-361)</td>
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<tr>
<td>Physics 2, Chemistry (124232, 122162-3)</td>
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<tr>
<td>Social Science Electives, Great Works (112204)</td>
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<tr>
<td>Statics, Dynamics, Mech. of Mtls. 1</td>
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<tr>
<td>P&amp;A Circuits 1, 2, 3** (201321-2-3)</td>
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<tr>
<td>Circuits Lab, 1, 2** (201332-3)</td>
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<td><strong>TOTALS</strong></td>
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**Circuits 3 and Circuits Lab 2 are required for students in Electrical Engineering and Mechanical Engineering; students in Civil Engineering should substitute Surveying.**

### ALL ENGINEERING—CLASS OF 1990

**Freshman 1986-87**

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<tr>
<th>Course</th>
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<tr>
<td>Writing 1, 2, Humanities Elective (112110-1)</td>
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<td>Calculus 1, 2, 3 (123163-261-2)</td>
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<td>Freshman Seminar, Physics 1, 3 (201120, 124231-3)</td>
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<td>FORTRAN for Engrs., Social Science Electives (201122, ..........)</td>
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<tr>
<td>Fund.-Engr. Drawing, Creative Design* (201101-3)</td>
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<td>Physical Education Service Courses</td>
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<td><strong>TOTALS</strong></td>
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*Intro-Engr. Design (201102) may be substituted for Creative Design.

### Basic Engineering

**100. PRE-ENGINEERING MATHEMATICS REFRESHER 0 hours** A review of those portions of high school mathematics necessary to start college mathematics. Topics included are algebra, geometry, trigonometry, and analytical geometry. Students who do not place sufficiently high in mathematics placement tests during the summer orientation are required to take this course to prepare to start calculus. Offered the two weeks prior to the opening of Fall Quarter.

**101. FUNDAMENTALS OF ENGINEERING DRAWING (1+3) 2 hours** An introduction to graphical communications and analysis. Use of projection theory to construct and read drawings of three-dimensional objects. Development of the ability to convey ideas and concepts using engineering drawings and sketches. Graphical representation of data and curve fitting.
102. INTRODUCTION TO ENGINEERING DESIGN (1+3) 2 hours Introduction to mechanical design applications. Emphasis on design layout, dimensioning, tolerancing and thread design. Introduction to computer-aided drafting, concluded with a comprehensive 3-week design project. Prerequisite: 201-101, concurrent with 201-122.

103. CREATIVE DESIGN (0+4) 2 hours Participation in student-generated group design projects, emphasizing engineering methodology, design, analysis, and communicative skills. Prerequisite: 201-101.

120. SEMINAR FOR ENGINEERING STUDENTS (1+0) 1 hour Schedules, irregularities in schedules, graduation requirements, class preparations, problem solving, taking of tests, background of various branches of engineering, technical and professional organizations and professionalism are covered. Designed to help the student to make the transition to college, as well as properly orient the student in the profession.

122. FORTRAN FOR ENGINEERS (4+0) 4 hours Introduction to the computer. Engineering problem solving with the computer using FORTRAN 77. The approach centers around fundamental problems of general engineering interest.

291. INDEPENDENT STUDY AND PROJECTS 1-3 hours Independent planning of an engineering or engineering-related project or independent study at the freshman level on topics of particular interest to the student and approved by the faculty. Prerequisite: Permission of instructor.

292. INDEPENDENT STUDY AND PROJECTS 1-3 hours Continuation of 291.

293. INDEPENDENT STUDY AND PROJECTS 1-3 hours Continuation of 292.

311. STATICS (3+0) 3 hours Fundamental principles of statics with vector methods. Emphasis on free body diagrams and equations of equilibrium. Topics include: resultants of force systems, centroids and centers of gravity, equilibrium, friction and moment of inertia. Use of S.I. Prerequisites: 123-261; 124-231.

312. DYNAMICS (3+0) 3 hours 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. Use of S.I. Prerequisite: 201-311.

313. MECHANICS OF MATERIALS 1 (3+0) 3 hours 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: 201-311.

321. PASSIVE AND ACTIVE CIRCUITS 1 (3+0) 3 hours Introductory concepts in circuit analysis. Solution of resistive circuits using Ohm's and Kirchhoff's Laws, mesh and nodal analysis, and network theorems. Prerequisites: 123-261; 124-233 or permission of instructor.

322. PASSIVE AND ACTIVE CIRCUITS 2 (3+0) 3 hours Analysis of transient and steady-state circuits. Phasor solutions, effective values of current and voltage, and instantaneous and average power. Prerequisite: 201-321.

323. PASSIVE AND ACTIVE CIRCUITS 3 (3+0) 3 hours Magnetically coupled circuits, polyphase circuits and Fourier analysis. Prerequisite: 201-322.

332. CIRCUITS LABORATORY 1 (0+2) 1 hour A laboratory study of electric circuits. Prerequisite: Concurrent 201-322.

333. CIRCUITS LABORATORY 2 (0+2) 1 hour Continuation of 332. Prerequisite: Concurrent 201-323.

391. INDEPENDENT STUDY AND/OR PROJECTS 1-3 hours Independent planning of an engineering or engineering-related project or independent study at the sophomore level on topics of particular interest to the student and approved by the faculty. Prerequisite: Permission of instructor.

392. INDEPENDENT STUDY AND/OR PROJECTS 1-3 hours Continuation of 391.

393. INDEPENDENT STUDY AND/OR PROJECTS 1-3 hours Continuation of 392.

401. PROBABILITY AND STATISTICS FOR ENGINEERS (3+0) 3 hours Probability and its application to engineering problems. Random processes in engineering, distributions, and regression analysis. Prerequisite: 123-262.
CIVIL ENGINEERING DEPARTMENT

Professors Archer, Milks (Chairman), Minich, Shah; Associate Professor Smalley; 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. Independent study is for students who have special interests which are not met by available courses. For those desiring to take independent study, a proposed contract must be submitted at the time of advance registration for the following quarter.

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.

While there is not a formal Co-op program available, it is possible for a student to obtain valuable practical experience with a suitable summer position. It is also possible to work out an academic program for a student who is willing to take longer than the normal four academic years. It is also possible to obtain some academic credit for an appropriate work experience under the Internship program.

CIVIL ENGINEERING—CLASS OF 1988

<table>
<thead>
<tr>
<th>Junior 1986-87</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
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<tr>
<td>Mechanics of Materials 2, Engr. Law &amp; Mgmt' Geology (202401-442-453)</td>
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<td>Material Science, Str. Analy 1, 2 (202456-412-3)</td>
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<td>Urban Planning, Transportation, Numerical Analy. (202436-435-411)</td>
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<td>Prob. &amp; Stat. for Engrs., Fluid Mechanics, Hydraulics (201401, 202422-423)</td>
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<td>Philosophy, Religion, Surveying (115, 116, 202301)</td>
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(Note: Class of '89 Students take surveying in the spring of the sophomore year)
### Civil Engineering—Class of 1987

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<tr>
<th></th>
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<tr>
<td>Environmental Engineering 1, Environmental Science*</td>
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<tr>
<td>Environmental Engr. 2</td>
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<td>Steel Design 1, 2, Finite Element Anal.</td>
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<td>C.E. Design Proj. 1, 2, C.E. Seminar</td>
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<td>Engr. Economy, Reinforced Concrete 1, 2</td>
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<td>(202541-525-6)</td>
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<td><strong>TOTALS</strong></td>
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</table>

**301. Surveying (2+6) 4 hours** Use of level, transit and tape, differential and profile leveling, traversing theory and practice, horizontal and vertical curves, and mapping. Prerequisite: Permission of instructor.

**401. Mechanics of Materials 2 3 hours** Deflection, combined loadings, repeated loading, dynamic loading, connections, formulation of statically indeterminate problems. Prerequisite: 201-312, 313, 123-361.

**411. Numerical Analysis 3 hours** Principles of numerical analysis used in solving structural problems, numerical methods, linear programming, optimization and applications. Prerequisites: 202-401 and 123-272.

**412. Structural Analysis 1 (3+3) 4 hours** Fundamentals of statically determinate structures; deflections, displacements, use of models to illustrate structural behavior, principle of superposition and study of elastic curve, computer methods. Prerequisite: 202-401.

**413. Structural Analysis 2 (3+3) 4 hours** Fundamentals of statically indeterminate structures; classical and approximate methods of solution, computer aspects. Prerequisite: 202-412.

**422. Fluid Mechanics (2+3) 3 hours** Engineering properties of fluids, fluid statics, fluid dynamics, fluid resistance, boundary layer theory, steady flow in pipes. Prerequisite: 201-312.

**423. Hydraulics (3+3) 4 hours** Hydraulic analysis of piping systems, steady flow in open channels, non-uniform flow in open channels, elements of hydrology, introduction to chemical quality of surface and subsurface waters, and design of water distribution systems. Field trip when appropriate. Prerequisite: 202-422.

**435. Transportation (3+0) 3 hours** Principles of transportation systems; economics, finance, and planning; and design, construction and maintenance. Field trips when appropriate. Prerequisite: Permission of instructor.

**436. Urban Planning (3+0) 3 hours** Principles of city and regional planning; land use, zoning, housing codes, subdivision regulations, metropolitan problems, and urban development. Field trips when appropriate. Prerequisite: Permission of instructor.

**442. Law and Management (3+0) 3 hours** Present and emerging legal issues concerning various aspects of the Civil Engineering profession. The organization, management, and control of a business enterprise. Organization and management systems. Prerequisite: Junior standing.

**453. Geology (3+3) 4 hours** Principles of physical geology. Physical and chemical properties of minerals and rocks, geologic processes, earth materials, processes of erosion and deposition, terrain investigation, geological mapping, ground water hydrology. Field trips when appropriate. Prerequisite: Permission of instructor.

**456. Material Science (2+3) 3 hours** A study of the fundamental physical and chemical properties of engineering materials and how they relate to mechanical behavior. Determination of physical properties in laboratory environment. Prerequisite: 201-313.

**473. Environmental Science (3+0) 3 hours** Environmental pollution effects on society. Causes, controls and standards of
water, air and land pollution. Hazardous wastes and control, possible solutions using interdisciplinary approach. Field trip when appropriate. Prerequisite: Permission of instructor.

491. INDEPENDENT STUDY 1-3 hours
The independent planning of an engineering design project by individual study of a topic of particular interest to the student. Prerequisite: Junior standing and departmental contract in advance.

492. INDEPENDENT STUDY 1-3 hours
Continuation of 491.

493. INDEPENDENT STUDY 1-3 hours
Continuation of 492.

511. C.E. DESIGN PROJECT 1 (3+0)
3 hours 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 completion of its design under the guidance of a professor or professors. A cap-stone course which applies previous civil engineering skills to the final design.

512. C.E. DESIGN PROJECT 2 (3+0)
3 hours A continuation of CE Design Project 1 under the specific guidance of a faculty member.

514. ENVIRONMENTAL ENGINEERING 1
(2+3) 3 hours Development of sources of water supply; determination of quantity of storm water; design of physical processes in water and waste water treatment systems. Field trips when appropriate. Prerequisite: 202-423.

516. ENVIRONMENTAL ENGINEERING 2
(3+3) 4 hours Physical, chemical and biological processes in water and waste water treatment systems. Design of a treatment system. Land and air pollution; control and standards; interpretation of reports; inspection of local plants. Solid waste management. Field trips when appropriate. Prerequisite: 202-514.

525. REINFORCED CONCRETE 1 (3+3)
4 hours Strength design of structural elements, flexural reinforcement development, diagonal tension, axially and eccentrically loaded columns, torsion, walls, footings; application of codes and specifications to design. Field trips when appropriate. Prerequisite: 202-413.

526. REINFORCED CONCRETE 2 (2+3)
3 hours Continuity, slabs, deflections, and economic considerations. Field trips when appropriate. Prerequisite: 202-525.

531. SOILS 1 (3+3) 4 hours
An introduction to soils engineering, physical properties of soils as affecting engineering design and construction, soil sampling, mechanics of soil masses, consolidation, settlement, and laboratory soil tests. Field trips when appropriate. Prerequisites: 202-423 and 202-453.

532. SOILS 2 (4+3) 5 hours
Analysis of stress conditions imposed on the supporting soils by foundations. Design of foundations, retaining structures and slopes. Field trips when appropriate. Prerequisite: 202-531.

542. ENGINEERING ECONOMY (3+0)
3 hours 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. (Formerly 202-533).

547. STEEL DESIGN 1 (3+3) 4 hours
The design of beams, columns, built-up members, and connections as applied to structural steel. Use of influence lines and various other techniques for determining maximum loadings. Field trips when appropriate. Prerequisite: 202-413.

548. STEEL DESIGN 2 (3+0) 3 hours
Theory of plastic design, load and resistance factor design, design of connections, plate girders, composite design, and fatigue. Mathematical simulation and optimization. Prerequisite: 202-547.

551. CIVIL ENGINEERING SEMINAR
(3+0) 3 hours 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: 202-511 and 512.

555. FINITE ELEMENT ANALYSIS (3+0)
3 hours Development of the finite element method as applied to various topics from continuum mechanics. Areas covered include plane, axisymmetric, curved plate, shell 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. Pre-requisite: Permission of instructor.

590. CIVIL ENGINEERING INTERNSHIP 3 hours Practical experience with engineers and engineering firms.

591. INDEPENDENT STUDY 1-3 hours The independent planning of an engineering design project or the individual study of a topic of particular interest to the student. Pre-requisites: Senior standing and departmental contract in advance.

592. INDEPENDENT STUDY 1-3 hours Continuation of 591.

593. INDEPENDENT STUDY 1-3 hours. Continuation of 592.

ELECTRICAL ENGINEERING DEPARTMENT

Professors Cowan, Johansen (Chairman), Klingenerger, Stahl (Leave); Associate Professor Theede; Assistant Professor Herr.

Electrical engineers have long pioneered the fields of power, automatic control, communications, and computers. Without controlled electricity, industry as we know it today could not exist. The ever expanding use 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.

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ELECTRICAL ENGINEERING—CLASS OF 1988

**Junior 1986-87**

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401. ENGINEERING ANALYSIS (4+0) 4 hours Selected analytical methods with engineering applications. Emphasis is on methods using complex variables and vector calculus. Prerequisite: 123-361.

412. FIELDS 1 (4+0) 4 hours Electromagnetic field theory with applications relevant to electrical engineering including vector rela-
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* Electives approved by the Department Chairman.

413. FIELDS 2 (3+0) 3 hours Continuation of 412 including magnetic fields, material properties, time varying fields, Maxwell's Equations, uniform plane waves. Prerequisite: 203-412.

424. ELECTRONICS 1 (4+0) 4 hours Operating principles of electronic devices (diodes, BJTs and FETs), models representing these devices and their use in simple circuitry. Prerequisite: 201-323.

425. ELECTRONICS 2 (4+0) 4 hours Large and small signal amplifiers, frequency response of amplifiers and oscillators. Prerequisite: 203-424.

426. ELECTRONICS 3 (3+0) 3 hours Introduction to the features of the design and performance of digital IC's and their use in implementing logic designs. Prerequisite: 203-425.

433. ENERGY CONVERSION 1 (3+0) 3 hours The underlying principles of energy conversion. Prerequisite: 203-412; concurrent 203-413.

442. LINEAR SYSTEMS 1 (3+0) 3 hours Analysis of linear signals and systems including time domain and Laplace Transform techniques. Prerequisites: 201-323 and 203-401.

443. LINEAR SYSTEMS 2 (3+0) 3 hours A continuation of 442. Analysis of continuous and discrete signals and systems using frequency domain and discrete domain methods. Prerequisite: 203-442.

453. ANALOG ELECTRONICS (3+0) 3 hours The study of feedback amplifiers and specialized linear integrated circuits such as timers, phase locked loops and voltage regulators. Prerequisite: 203-425.

471. ELECTRICAL LABORATORY 1 (0+3) 1 hour Instrumentation and measurement circuits and techniques. Prerequisite: 201-323.

481. ELECTRICAL LABORATORY 2 (0+3) 1 hour (Formerly 452). Study of active devices and their associated circuits. Prerequisite: Concurrent 203-424.

482. ELECTRICAL LABORATORY 3 (0+3) 1 hour Continuation of 481. Prerequisite: Concurrent 203-425.

483. ELECTRICAL LABORATORY 4 (0+3) 1 hour Laboratory study of digital I.C.'s. Prerequisite: Concurrent 203-425.

502. ENGINEERING METHODS 1 (3+0) 3 hours The basic fundamentals of engineering economics with application to electrical systems. Prerequisite: EE senior status.

503. ENGINEERING METHODS 2 (3+0) 3 hours The professional method of dealing with engineering problems. The design-analysis-synthesis of a problem using this process. Prerequisite: 203-502.

511. MICROWAVES (3+0) 3 hours A study of transmission line characteristics and design. Analysis and design of distributed parameter for impedance matching in high frequency systems. Prerequisite: 203-413.

513. CIRCUIT SYNTHESIS (3+0) 3 hours Introduction to the principles of modern circuit synthesis. Prerequisite: 203-443.
524. ELECTRONICS 4 (2+3) 3 hours Continuation of 426 with emphasis on sequential circuits and state machine design. Prerequisite: 203-426.

525. ELECTRONICS 5 (2+3) 3 hours Continuation of 524 with emphasis on microprocessor implementation of logic design. Prerequisite: 203-524.

531. ENERGY CONVERSION 2 (3+0) 3 hours Continuation of 433 with emphasis on direct current and alternating current machinery. Prerequisite: 203-433.

532. ENERGY CONVERSION 3 (3+0) 3 hours An introduction to power systems analysis with load flow, faults and stability topics. Prerequisite: 203-531.

541. CONTROL SYSTEMS 1 (3+0) 3 hours Theory of classical feedback control systems including modeling, transfer function formulation, characteristics, frequency response and root locus. Computer-aided analysis and design. Prerequisite: 203-443.

542. CONTROL SYSTEMS 2 (3+0) 3 hours Analysis and design of linear control systems with emphasis on compensation. Prerequisite: 203-541.

543. CONTROL SYSTEMS 3 (3+0) 3 hours Discrete systems and the z-transform method. State-space analysis of control systems. Prerequisite: 203-541.

553. LINEAR INTEGRATED CIRCUITS (3+0) 3 hours Internal circuit design of linear integrated circuits and their applications. Prerequisite: 203-426.

561. ELECTRICAL LABORATORY 5 (0+3) 1 hour Laboratory study of feedback control systems. Prerequisite: Concurrent 203-541.

564. SENIOR ELECTRICAL DESIGN 1 (3+0) 3 hours Initiation of a comprehensive design project relevant to electrical engineering. Prerequisite: senior standing in electrical engineering.

565. SENIOR ELECTRICAL DESIGN 2 (3+0) 3 hours Continuation of comprehensive design project. Prerequisite: 203-564.

566. SENIOR ELECTRICAL DESIGN 3 (3+0) 3 hours Completion of a comprehensive design project. Prerequisite: 203-565.

571. ELECTRICAL LABORATORY 6 (0+3) 1 hour (Formerly 552). Laboratory study of transmission line and microwave circuits. Prerequisite: Concurrent 203-511.

572. ELECTRICAL LABORATORY 7 (0+3) 1 hour (formerly 562). Study of the generalized machine and other DC, synchronous, and induction machines. Prerequisite: 203-531.

582. COMMUNICATION THEORY 1 (3+0) 3 hours (Formerly 572). An introduction to the principles of communication theory. Prerequisite: 203-443.

583. COMMUNICATION THEORY 2 (3+0) 3 hours A continuation of 203-582. Design of time division multiplexers, analog and digital modulation and detection techniques. Prerequisite: 203-582.

590. PROJECTS 1-3 hours Independent planning and conduct of an engineering design, or development project in electrical engineering. Prerequisite: Permission of instructor.

591. INDEPENDENT STUDY 1-3 hours Individual study of a topic of particular interest to the student in electrical engineering. Prerequisite: Permission of instructor.

592. SPECIAL TOPICS 1-3 hours A study of selected topics of current interest in electrical engineering. Prerequisite: Permission of instructor.

MECHANICAL ENGINEERING DEPARTMENT

Professor Burton (Chairman); Associate Professors Maier, Rider, Smith, Whisler.

Mechanical engineering is that branch of the profession of engineering which is concerned with the conversion of energy from one form to another, the design of machines, and the control of various processes. Mechanical engineers are involved in creative design, research, development, and management. They are being challenged today, as never before, to solve many critical problems related to productivity, mass transportation, and the supply of energy.

Every mechanical engineering student uses extensively the engineering laboratories along with the computer graphics and computer-aided design 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.
MECHANICAL ENGINEERING—CLASS OF 1987
Senior 1986-87

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<td>Heat Transfer 1, 2, Energy Systems (204521-2-6)</td>
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<td>Vibration Analysis, Control System, Science</td>
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**Acceptable science electives: Nuclear Physics 124353, Modern Physics 124303, Geology 202453.
***Approval of the Department Chairman.

MECHANICAL ENGINEERING—CLASS OF 1988
Junior 1986-87

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401. MECHANICS OF MATERIALS 2
(3+3) 4 hours Beam deflection-determinate and indeterminate. Three-dimensional stress and strain, reversed loading, column stability and dynamic loading. Use of S.I. The measurement of material properties and the use of stress analysis techniques. Prerequisite: 201-313.

402. ENGINEERING MATERIALS (3+0)
3 hours Introduction to the microscopic structure of engineering materials and its relation to their mechanical properties. Evaluation of these properties for material selection in design applications. Metallurgical aspects of metals including equilibrium diagrams and heat treating. Production and classification of ferrous, non-ferrous and non-metallic materials. Prerequisite: 122-162.

403. MANUFACTURING PROCESSES
(3+2) 4 hours 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: 204-402.

405. THEORY OF MACHINES 1 (3+3)
4 hours Analysis and synthesis of mechanisms for motion, velocity, and acceleration properties. Linkages, cams, gears, and gear trains are treated. Analytical, graphical, and computer solutions are covered. Laboratory assignments deal with analysis and synthesis. Prerequisite: 201-312.

406. THEORY OF MACHINES 2 (3+2)
4 hours Continuation of 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: 204-405.

415. THERMODYNAMICS 1 (4+0) 4 hours Fundamentals of classical thermodynamics. Heat, work, and properties of pure substances. The First and Second Laws of Thermo-
dynamics. Irreversibility and availability and treatment of some power and refrigeration cycles. Prerequisites: 122-162 and 124-232.

416. THERMODYNAMICS 2 (4+2) 5 hours
Relations among thermodynamic properties, mixtures, chemical reactions and equilibrium. Topics in gas dynamics and turbomachines. Laboratory experience with fluid property variations, refrigeration and heat engine systems, fans and compressors. Prerequisite: 204-415.

424. ANALYTICAL METHODS (3+1.5)
4 hours A treatment of numerical methods applicable to problems arising in engineering practice; exact and approximate solutions are investigated; finite methods are used for linear and nonlinear equation solution; ordinary and partial differential equations are treated. Prerequisites: 123-361 and 201-122.

426. FLUID MECHANICS 1 (3+0) 3 hours
An introduction to the mechanics of fluids; the state of stress in a static fluid; similitude and dimensional analysis; the dynamics of inviscid ideal fluids, Euler's equation, Navier-Stokes equations, Bernoulli's equation, and momentum equation. Prerequisite: 201-312.

435. ENGINEERING ANALYSIS (3+0)
3 hours The professional method as it applies to the analysis of engineering problems. Emphasis is placed on learning to deal with new situations in terms of fundamental principles. Prerequisite: 123-361.

443. NON-ME COMPUTER GRAPHICS
(3+0) 3 hours Practical studies involving the applications of computer graphics. Emphasis on "software" required for computer graphics with some considerations of "hardware." Programming problems oriented toward non-engineering applications. Prerequisite: 123-203 or 201-122.

444. COMPUTER GRAPHICS (2+3)
3 hours Practical studies involving the application of computer graphics in industry. Studies of hardware configurations and supporting software packages. Prerequisite: ME Junior status.

445. FINITE ELEMENT ANALYSIS (3+0)
3 hours The finite element techniques are studied. Stress-deformation problems are solved. Modeling strategies are presented. The ANSYS computer is used.

511. MECHANICAL DESIGN 1 (3+3)
4 hours Fatigue analysis, fracture mechanics, and statistical considerations in design.

Analysis and synthesis of various machine parts. Introductory design problem given. Initiation of comprehensive design project. Use of S.I. and CAD. Prerequisites: 204-403 and 406.

512. MECHANICAL DESIGN 2 (3+3)
4 hours Analysis and synthesis of various machine parts. Design problem given. Continuation of comprehensive design project. Use of S.I. and CAD. Prerequisite: 204-511.

513. MECHANICAL DESIGN 3 (1+6)
3 hours Completion of the comprehensive design project of 204-511, 512. Product liability, legal problems, and ethics studied. Introduction to designing with plastics and optimization. Use of CAD. Prerequisite: 204-512.

521. HEAT TRANSFER 1 (3+0) 3 hours

522. HEAT TRANSFER 2 (3+2) 4 hours
Fundamentals of convection; dimensional analysis; free and forced convection; boiling, two-phase heat transfer and heat pipes. Applications to design. Laboratory reinforced study of conduction, convection, radiation and design. Prerequisite: 204-521.

526. ENERGY SYSTEMS (3+2) 4 hours
Heat power systems utilizing concepts of thermodynamics, fluid mechanics, and heat transfer. Examples such as solar energy and energy recuperation systems are studied along with optimization techniques. Laboratory involves energy related projects. Prerequisites: 204-416,522 and 534.

534. FLUID MECHANICS 2 (3+2) 4 hours
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. Prerequisite: 204-426.

541. VIBRATION ANALYSIS (3+0)
3 hours Fundamentals of linear and nonlinear vibration of single degree of freedom, multi-degree of freedom, and continuous systems. Prerequisite: 204-406.

542. CONTROL SYSTEMS (4+2) 5 hours
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: 204-424 and 541.

556. PRODUCTION ENGINEERING (3+0) 3 hours An introduction to scientific organizing, standardizing, and operating principles in production engineering. Capabilities of manufacturing processes. Fundamentals of time and motion study, engineering economy, statistical quality control, location and material flow for a manufacturing enterprise. Prerequisite: 204-403.

590. MECHANICAL ENGINEERING PROJECT 1-5 hours Practical studies of investigations involving the application of original thought, the determination of new information and/or new application of known information or equipment. Prerequisite: ME senior status.
The Raabe College of Pharmacy and Allied Health Sciences at Ohio Northern University endeavors today, as in the past, to meet the high standards of education demanded by the health professions. Currently the college occupies a modern building designed and equipped to provide the facilities required for programs in the health-life-physical sciences.

Throughout its 102-year history, the Ohio Northern University College of Pharmacy and Allied Health Sciences has played an important role in pharmaceutical education and the education of allied health professionals. Its position in pharmaceutical education in Ohio is particularly significant. Over 3,000 pharmacists have been graduated by this institution and its graduates are particularly active in local, state, and national health-related organizations.

The Raabe College of Pharmacy and Allied Health Sciences is an integral part of Ohio Northern University. It is recognized and approved by the Board of Pharmacy of the State of Ohio. It is a member of the American Association of Colleges of Pharmacy and is accredited by the American Council on Pharmaceutical Education.

Aims and Objectives

In addition to the general objectives set forth by the University, the College of Pharmacy and Allied Health Sciences includes the following among its aims and purposes:

- Preparing students to meet satisfactorily the professional and cultural standards expected of health care professionals and to carry their share of the responsibility for improvement of the quality of the health, welfare and educational services to their communities.
- Counseling students in the development of self-reliance, character and ethical concepts to the end that will render safe and efficient health care services.
- Acquainting students with the value of membership in local, state and national health associations and in civic, social and religious bodies of the communities in which they live.

To accomplish these scholastic, professional, and social goals, faculty counselors are available to advise students concerning their plans of study and every encouragement is offered to maintain high standards of scholarship. Participation in a reasonable number of campus activities is encouraged in the belief that such activities, properly adjusted to the student's opportunity and ability to carry them, will broaden his outlook, enrich his college experience, and add much to his preparation for life.

Bachelor of Science Degree in Pharmacy

The Bachelor of Science Degree in Pharmacy is a five year curriculum that provides a foundation in the basic sciences of pharmacy as well as a comprehensive understanding of the health care system. The curricular design includes a broad range of courses in the social sciences, physical sciences, and the humanities. Additionally there is experiential work in clinical medical settings as well as a structured externship in acute care institutions, community pharmacies and other health care settings.

For the purposes of administration the pharmacy program is divided into two major divisions: the Lower Division, consisting of the first two years (P-1 and P-2), and the Upper Division, consisting of the last three years (P-3, P-4, and P-5).

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.
High School Graduates It is recommended that high school graduates should have completed the college preparatory course including four years of English, three years of mathematics (algebra I and II and plane geometry) and three years of science (including biology and chemistry). Priority will be granted to students with additional credits. Students found to be deficient in these areas may be required to pursue remedial work prior to being scheduled in the regular course of study.

Transfer Students A student desiring to transfer from another accredited college or university must present a transcript of his record at that institution and a copy of its current catalog. Approval for admission and advanced placement will be determined by the faculty of the College upon review of the student's previous record. Full credit will be given for all work satisfactorily completed in other recognized institutions of higher learning provided such work is parallel to the requirements for graduation from this institution. Credit will not be allowed for a course in which the lowest passing grade was received (i.e., grade below C).

To enter the regular course of study, the candidate must prepare a schedule of studies with the aid of an adviser and approval of the Dean, and pay tuition and fees as stated elsewhere in this catalog. Students entitled to advanced standing may enter at the time approved by the Dean.

Classification of Students

Students enrolled in the Pharmacy program are classified as P-1 students until they have earned a minimum of forty-five quarter hours credit, at which point they are advanced to P-2 standing. In order to gain admission to the Upper Division and P-3 status, a student must have completed a minimum of 90 quarter hours of academic work and all of the Lower Division courses that are prerequisite to the regular third year schedule. P-4 or P-5 standing is gained when a majority of the required course work in the previous year has been completed and a minimum of 135 and 180 quarter hours of academic credit respectively, has been earned. Additionally, students whose accumulative average in their required scientific and professional courses is below 2.00 are not eligible for advancement to the P-3, P-4 or P-5 class. All required courses in the Lower Division must be completed before the student is permitted to enter the second year of the Upper Division.

Dual-Degree Program

Superior students may elect to earn an additional degree from the College of Arts and Sciences or from the College of Business Administration concurrently with the Bachelor of Science degree in the College of Pharmacy and Allied Health Sciences. The student following this option pursues both degrees simultaneously under the supervision of an adviser from the College of Pharmacy and Allied Health Sciences and an adviser selected from the department of the chosen major in that College. Tuition is charged at the College of Pharmacy and Allied Health Sciences rate and the student receives the appropriate degree in each college upon completion of all requirements.

A student taking the dual degree program must meet all of the requirements established for each degree. Certification of completion of these requirements is made by the college granting the degree.

Information relative to the procedure for declaring a dual degree program is available in the office of the Dean of the College of Pharmacy and Allied Health Sciences.

Standards of Scholarship

A student who fails to maintain the prescribed standards of scholarship will be subject to one of the following actions, namely, 1) being placed on probation, 2) being suspended from the College, or 3) being dismissed from the College.

If a student's accumulative quality point average falls below 2.00, the student will be placed on probation. If a student on probation does not restore his quality point average during the following or any subsequent quarter, he will be subject to further academic action. A detailed procedural guide for academic action is available for the student's perusal.

If a student receives a "D" or "F" in any of the required scientific or professional courses of the first year, he may repeat the course once and only the last grade earned will be used in calculating grade point averages. The original grade remains on the student's record. This rule is applicable only for first year scientific or professional courses and is limited to students in Lower Division status.

Any student with an unusually low quality point average for any quarter may be placed on probation.

Actions to suspend or dismiss a student from the College shall be initiated by the Academic Actions Committee when just cause for such action is evident.
Principles of Disease 373 3 hours
General Education* 12 hours
Electives 2 hours
TOTAL 51 hours

Fourth Year
Pharmacy Practice 461, 462 6 hours
Pharmacy Practice Laboratory 463 1 hour
Sterile Products 464 2 hours
Prescription Products in Practice 465 1 hour
Introductory and Autonomic Pharmacology 491 4 hours
Pathology and Pharmacology of the Central Nervous System 492 4 hours
Pathology and Pharmacology of the Cardiovascular and Endocrine System 493 5 hours
Laboratory in Biomedical Sciences 494, 495, 496 3 hours
Chemotherapy of Infectious Disease 421 4 hours
Electives 24 hours
TOTAL 54 hours

Fifth Year
Toxicology 521 3 hours
Pharmaceutical Law 551 4 hours
Pharmaceutical Marketing 552 3 hours
Pharmaceutical Management 553 4 hours
Health Care Systems 554 4 hours
Clinical Pharmacy 560 6 hours
Therapeutics 562 4 hours
Introduction to Drug Information 563 2 hours
Structured Externship 580 15 hours
Electives 6 hours
TOTAL 51 hours

*General education courses are selected from among the following:

Humanities 3 hours selected from Philosophy 100, Logic 234, Knowledge and Truth 237, Ethics 238 or Bioethics 338. 3 hours selected from Introduction to Religion 105, Introduction to the Bible 106, Religion East and West 107, or Introduction to Christianity 108.

Social Science 6 hours selected from Psychology 100, Sociology 105, or any course in department 133 at the 200 level or above. 6 hours selected from Political Science 201, 202, 203; or recent American History 361, 362.

Fine Arts 3 hours of non-performance fine arts selected from Art 100, Music 100, Theatre 105 or any 200 level non-performance course in department 151, 152, or 153.

Business Administration 6 hours selected from Accounting 131, 132, 133; Economics 100, 202, 203; or Business Law 322, 323, 324.

In-depth General Education 6 hours selected from any English course at the 200 level or above (excluding performance courses), any philosophy and religion course at the 200 level or above (in addition to the course used to satisfy the humanities requirement), any foreign language, any sociology, psychology or social welfare course at the 200 level or above (in addition to the courses used to satisfy the social science requirement), any course in business administration at the 300 level or above, or any course in political science and history at the 300 level or above.

For descriptions of the lower division courses and general education courses turn to the listing of the courses offered in the College of Arts and Sciences and the College of Business Administration.

First number in parentheses is lecture hours per week, second number is laboratory hours per week.

DEPARTMENT OF PHARMACY AND HEALTH CARE ADMINISTRATION
(Department 311)
Professors Beltz, Henderson, Stansloski (Chairman), Previte, Stuart, Theodore, Vottero; Associate Professors Reiselman, Shoemaker; Assistant Professors Buyukyaylaci, Hurford, Jones, Lucas (part-time), Stanovich; Clinical Instructors J. Turner; Assistant Instructor M. Turner.

101. PHARMACY ORIENTATION (1+0)
1 hour A general orientation to the University.

102. THE PROFESSION OF PHARMACY
I (1+0) 1 hour The profession of pharmacy; its development, its educational requirements, the role of the pharmacist and the challenges.

103. THE PROFESSION OF PHARMACY
II (1+0) 1 hour Continuation of 102.

212. INTRODUCTION TO PHARMACY PRACTICE 3 hours An introduction to the practice of pharmacy which includes practical principles of law as they pertain to pharmacy interns, Third Party Payment practices, and patient profiles. A major emphasis is placed on mathematics as applied to pharmacy practice including the prescription,
Latin symbols, metrology, reducing and enlarging formulae, dilution and concentration, isotonic solutions and electrolyte solutions.

321. PHARMACUTICS I (3+3) 4 hours A study of solid dosage forms, including their preparation, characteristics, and the physical and chemical phenomena affecting the availability of the active ingredient from these dosage forms. In the laboratory, solid dosage forms are prepared, both according to the laboratory text, and extemporaneously. Prerequisite: P-3 standing, 122-233. Corequisite: 311-212.

322. PHARMACUTICS II (3+3) 4 hours A study of the various types of solution dosage forms and related physical and chemical phenomena. These include solubility characteristics, pH considerations and their effect on solubility, stability, and compatibility. These principles are applied in the laboratory, in the preparation of homogeneous dosage forms. Prerequisites: 311-212 and 321.

323. PHARMACUTICS III (3+3) 4 hours A study of heterogeneous dosage forms including suspensions, ointments, emulsions and suppositories. In the laboratory, the theoretical aspects of dispersion, interfacial phenomena, and rheology are applied in the preparation of these dosage forms. Prerequisite: 311-322.

343. BIOPHARMACUTICS AND INTRODUCTORY PHARMACOKINETICS (3+0) 3 hours The characteristics, time course, factors influencing and the mathematical models of drug absorption, distribution, metabolism, and excretion. Prerequisite: P-3 standing. Corequisites: 212-333 and 311-323.

421. INTRODUCTION TO HOSPITAL PHARMACY (3+0) 3 hours An introductory presentation of 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. Prerequisite: P-3 standing or permission of instructor.

422. PHARMACY SERVICE TO NURSING HOMES (1+0) 1 hour The pharmacist's opportunities and responsibilities in nursing home practice. Main emphasis on consulting and distribution functions which include 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. HISTORICAL PHARMACY (3+0) 3 hours The educational, organizational and professional growth and development of pharmacy in the United States. Prerequisite: P-4 standing.

441. INTRODUCTION TO RADIOACTIVE PHARMACEUTICALS (3+0) 3 hours A survey course in the types of radiation, methods of detection and measurement and the application of radioisotopes to modern health care. Prerequisite: Permission of instructor.

461. PHARMACY PRACTICE I (3+0) 3 hours A study of the contemporary filling of physician orders. Topics include patient counseling, drug interactions, patient profile systems, and dispensing systems. Prerequisites: P-4 standing, 311-323 and 343.

462. PHARMACY PRACTICE II (3+0) 3 hours A study of the appropriate use of nonprescription drugs, products and devices. Prerequisites: 312-361, 373, and 492. Corequisite: 312-493.

463. PHARMACY PRACTICE LABORATORY (0+3) 1 hour A laboratory course; practical experience in the compounding and dispensing of prescription orders. The emphasis is on accuracy and providing adequate patient counseling information. Prerequisite: 311-461.

464. STERILE PRODUCTS (2+0) 2 hours The basic principles, equipment and techniques involved in the preparation, manipulation, and administration of parenteral products and other sterile dosage forms. Prerequisites: P-4 standing and 311-323.

465. PRESCRIPTION PRODUCTS IN PRACTICE (1+0) 1 hour A survey of pertinent information concerning the most common prescription drugs. Prerequisites: 311-323, 343 and 312-492. Corequisite: 312-493.

471. SEMINAR IN IV THERAPY (2+0) 2 hours The seminar discusses in detail various aspects of IV therapy. Topics may include complications of specific types of IV therapy and fluid therapy. Prerequisite: 311-464 or permission of the instructor.

472. SEMINAR IN CANCER (2+0) 2 hours Cancer etiology and epidemiology. Students learn by researching an area of their interest and presenting it to the class. Concepts dis-
cussed include "survival," physical and mental consequences of therapy, death and dying, and the care of the terminally ill. Prerequisite: P-4 standing or permission of instructor.

473. THIRD PARTY REIMBURSEMENT SYSTEMS (3+0) 3 hours The history and development of Third Party Programs including types of benefits, forms used, methods of payment, limitations, proposed methods of solving problems and surveillance and utilization review. Prerequisite: P-4 standing.

474. DOSAGE FORM DESIGN (2+0) 2 hours The design and formulation of various dosage forms, with particular emphasis on the effect that the various formulation factors have on the bioavailability of active ingredients. The dosage form is discussed and viewed as a drug delivery system. Prerequisite: 311-323.

475. PARENTERAL PRODUCTS SEMINAR (2+0) 2 hours Various aspects of parenteral medication. This includes, but is not limited to, their characteristics, formulation, preparation, administration and biopharmaceutical behavior. Prerequisite: 311-323 or permission of instructor.

476. INFECTIOUS DISEASES (3+0) 3 hours The pathophysiology and treatment of various infectious diseases. The problem solving approach is used in which the student is asked to present therapy for a described disease. Prerequisites: 312-373 and 421.

477. OUTPATIENT CLINICAL PHARMACY 1 hour Methods of providing clinical services in the outpatient environment. Students learn by researching a topic of their interest and presenting it to the class. Prerequisite: Permission of instructor.

478. OUTPATIENT PHARMACY SERVICE (0+3) 1 hour Laboratory course that serves the needs of the Health Center through the operation of the Model Pharmacy. Specific components include: the dispensing of prescriptions, patient counseling and patient profile maintenance. For students with limited or no internship experience. Prerequisites: Valid Ohio intern license.

510. COSMETIC SCIENCE (3+0) 3 hours An overview of various types of cosmetics; how they are prepared and the rationale for their formulation. Prerequisite: Permission of instructor.

515. COSMETIC TECHNOLOGY (0+3) 1 hour An optional laboratory for Cosmetic Science 510. A literature search on cosmetic formulation is required. The laboratory session will consist of compounding the cosmetic preparation that the student had previously investigated. Prerequisite: Permission of instructor.

530. MANUFACTURING PHARMACY (1+6) 3 hours The formulation and fabrication by mechanized methods of a variety of pharmaceutical dosage forms. Prerequisite: Permission of instructor. Graded S-U.

551. PHARMACEUTICAL LAW (4+0) 4 hours A study of professional ethics and the philosophy, requirements, administration, and enforcement of local, state and federal laws related to the practice of the profession of pharmacy. Prerequisite: P-5 standing.

552. PHARMACEUTICAL MARKETING (3+0) 3 hours Facts, considerations, and principles which underlie the flow of drug products, and the availability or use of pharmaceutical and other professional services from production to consumption. Principal economic, legislative, and social forces affecting the health care industry are discussed, and resulting policies and procedures are appraised.

553. PHARMACEUTICAL MANAGEMENT (4+0) 4 hours Organization policies, planning and controlling, the relation of pharmaceutical services, professional practice and pharmacy operation to general business activity, patients and human service professions, and public health.

554. HEALTH CARE SYSTEMS (4+0) 4 hours A study of the development of the health care system and its present status. Contemporary issues in health care will be examined from a systems viewpoint. Prerequisite: P-5 standing.

560. CLINICAL PHARMACY (3+17) 6 hours An experience in contemporary clinical pharmacy. Taught in area hospitals. The student is asked to apply pharmaceutical principles to the study of the relationship among drugs, diseases and patients. Transportation is arranged by the student. Must be taken with 311-562 and 563. Prerequisites: 311-462, 463, 464, 465, 312-421, 493; P5 standing and a valid Ohio intern license.
561. CLINICAL CLERKSHIP (0+9) 3 hours Experience in area hospitals, with a view to expanding the student's knowledge of health care delivery and drug disease relationships. An in-depth experience in specific disease states. Prerequisites: 311-560 and permission of the department chairman.

562. THERAPEUTICS 1 (4+0) 4 hours This course is designed to introduce the student to the process of therapeutic decision making. The course is taught on a problem-oriented record model. A variety of disease states is covered. Must be taken with 311-560 and 563. Prerequisites: 311-462, 463, 464 and 465; 312-421, 493; P-5 standing.

563. INTRODUCTION TO DRUG INFORMATION (1+3) 2 hours An introduction to the field of drug information. Special emphasis is placed on retrieval and evaluation of drug literature, dissemination and communication of non-biased drug information and the organization and development of a drug information center. Must be taken with 311-560 and 562. Prerequisites: 311-462, 463, 464 and 465; 312-421, 493; P-5 standing.

564. APPLIED PHARMACOKINETICS (3+0) 3 hours The application of pharmacokinetics to institutional and community practice. Especially emphasized are drug concentrations in body fluid, laboratory data, disease states and drug interactions as related to dose regimen for therapeutic management of individual patients. Prerequisites: 311-323 and 343.

580. STRUCTURED EXTERNSHIP (0+45) 15 hours A program of structured experiences in various health care centers. Provides the student with experience in the actual application of material learned in didactic subjects. Prerequisites: P-5 standing; 311-462, 463, 464 and 465; 312-421 and 493, and a valid Ohio Intern License.

590. SPECIAL TOPICS IN PHARMACY AND HEALTH CARE ADMINISTRATION 1-3 hours Prerequisite: Permission of the instructor.

594. SEMINAR IN PHARMACY AND HEALTH CARE ADMINISTRATION 1-3 hours Prerequisite: Permission of the instructor.

597. INDEPENDENT STUDY-PHARMACY AND HEALTH CARE ADMINISTRATION 1-3 hours Prerequisites: Permission of the department chairman and a 2.50 accumulative point average.

DEPARTMENT OF PHARMACOLOGY AND BIOMEDICAL SCIENCES (Department 312)
Proffessors Awad, Bhattacharya, Faulknor, Gossel (Chairman), Mallin, L. Smith, Stewart, Associate Professor M. Milks.

301. SEMINAR IN PHARMACY COMMUNICATIONS (3+0) 3 hours Basic elements of communication between health care personnel. Didactic presentation and role-playing to gain experience in communication skills. Prerequisite: P3 standing or permission of instructor.

302. MEDICAL TERMINOLOGY (3+0) 3 hours An introductory course in medical terminology specifically, and scientific terminology in general. Emphasis on root words and affixes which have general and frequent occurrence in the communications of medicine, pharmacy, biology, chemistry, and related areas.

341. BIOCHEMISTRY I (4+0) 4 hours The study of living organisms with emphasis on the human system. Acid-base balance, buffers, biochemical energetics, the chemistry of amino acids, proteins, enzymes and carbohydrates, and the intermediary metabolism of carbohydrates. Prerequisite: 122-233.

342. BIOCHEMISTRY II (4+0) 4 hours A continuation of 312-341. Includes amino acid metabolism, the chemistry and metabolism of lipids, properties and biosynthesis of nucleic acids, protein biosynthesis, biochemical genetics and clinical biochemistry. The roles of vitamins in metabolism are emphasized throughout the biochemistry sequence. Prerequisite: 312-341

351. CLINICAL BIOCHEMISTRY (3+0) 3 hours An introduction to the use of biochemical tests as agents for the diagnosis of human disease states. The theory, methodology, utility, significance, and reliability of such tests are discussed. Prerequisite: 312-342 or permission of instructor.
352. NUTRITION (3+0) 3 hours An introduction to the principles of nutrition as they apply to the health practitioner. Nutritional needs, evaluation of nutritional status, deficiency diseases, nutrition in various physiological and pathological states, diet therapy in disease, food facts and nutritional misinformation. Prerequisite: 312-341 or permission of instructor.

361. MICROBIOLOGY (4+0) 4 hours An introductory course emphasizing fundamentals of general microbiology and a general survey of techniques and principles pertaining to bacteria, yeasts, molds, viruses, and rickettsia. Microbial pathogens and a detailed consideration of the host-parasite relationship. Prerequisite: one year of general biology or botany-zoology. Corequisite: 312-341.

362. MICROBIOLOGY (3+3) 4 hours An introduction to the fundamentals of general and medical microbiology for students of medical technology. Prerequisite or corequisite: One year of biological science.

371. MEDICINAL CHEMISTRY (5+0) 5 hours A systematic interfacing of basic biological information with basic chemical information. The effects of the chemical on the biological system, and means by which the biological system manipulates and changes the chemical. The relationship between the chemistry of drugs and their biological action. Emphasis is placed on recognition of pharmacophoric groups, structure activity relationships, chemical properties, and nomenclature of drugs. Prerequisite: 122-233. Corequisite: 312-341.

372. IMMUNOLOGY AND BIOLOGICALS (2+0) 2 hours An introduction to basic immunology including the types of immune responses, nature of antigens and antibodies, and antigen-antibody interactions as a basis for understanding the biological products currently recommended for use in the United States. Emphasis is on those biologicals used in the diagnosis, prevention and treatment of the most common infectious and immunologic diseases. Prerequisite: 312-341. Corequisite: 312-361.

373. PRINCIPLES OF DISEASE (3+0) 3 hours An introduction to the pathological principles involved in human disease. The nature, etiology, progression, and prognosis of specific diseases are studied from an organ or organ-system approach. Diseases involving the central nervous system, cardiovascular system and endocrine system are deferred to the pathology pharmacology sequence (312-492, 493). Prerequisites: 121-332; 312-341.

381. NATURAL PRODUCTS I (2+0) 2 hours An introductory course which deals with a discussion of important examples of medicinal constituents found in terrestrial and marine plant origin. Brief history and sources of selected major plant constituents, the chemical, biological properties and category of uses. Prerequisites: One year of biology and one year of organic chemistry.

382. NATURAL PRODUCTS II (2+0) 2 hours A continuation of Natural Products I dealing specifically with a discussion of natural products found in both terrestrial and marine animals. Emphasis is on biomedicinals such as hormones, enzymes and on the biotoxins elaborated from these animals. Prerequisite: 312-381.

421. CHEMOTHERAPY OF INFECTIOUS DISEASE (4+0) 4 hours A study of the antibiotics and synthetic chemicals used in the prophylaxis and treatment of infectious diseases. A drug oriented approach for selected diseases. Selective toxicity; dosage forms, choices in therapy; differential diagnosis; MIC; resistance; therapy of common infections; therapy of acid-fast infections; parasitic disease treatment. Prerequisites: 121-333 and 312-361.

441. MEDICINAL PLANT PROPAGATION AND CULTIVATION (2+3) 3 hours 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, to write and to present reports. Prerequisite: Permission of instructor.

442. MEDICINAL PLANTS (3+0) 3 hours A consideration of the economic, geographic, commercial and biological aspects of medicinal plants as a source of drugs, spices, herbal and folklore remedies. Common poisonous plants, drug abuse plants and potentially harmful toxic constituents of foodstuff plants are emphasized. Prerequisite: Permission of instructor.

462. VIROLOGY (2+0) 2 hours A comprehensive coverage of the virus-host relation-
ship from the viewpoint of molecular biology. Model systems are discussed utilizing the bacteriophage. Prerequisites: 312-342 and 361; or permission of instructor.

491. INTRODUCTORY AND AUTONOMIC PHARMACOLOGY (4+0) 4 hours
The principles of pharmacology and a study of drugs which affect the autonomic nervous system; autacoids; antineoplastic agents; and several miscellaneous drug classes. The pharmacodynamic and pharmacokinetic properties of the drugs are related to therapeutic and toxicological aspects of drug therapy. Prerequisites: 121-333, 312-342, 311-343; P-4 standing. Corequisite: 312-373.

492. PATHOLOGY AND PHARMACOLOGY OF THE CENTRAL NERVOUS SYSTEM (4+0) 4 hours
A study of diseases of the central nervous system and the pharmacology of the drugs used to treat these disorders. The pharmacodynamic and pharmacokinetic properties of these drugs are related to therapeutic and toxicological aspects of the treatment of the diseases. Prerequisites: 312-491, 373 and P-4 standing.

493. PATHOLOGY AND PHARMACOLOGY OF THE CARDIOVASCULAR AND ENDOCRINE SYSTEMS (5+0) 5 hours
A study of diseases of the cardiovascular, renal and endocrine systems and the drugs used to treat these disorders. The pharmacodynamic and pharmacokinetic properties of these drugs are related to therapeutic and toxicological aspects of the treatment of the diseases. Prerequisites: 312-373, 491 and P-4 standing.

494. LABORATORY IN THE BIOMEDICAL SCIENCES I (0+3) 1 hour
Demonstrations and student-participation laboratories using chemical and biological methodology. Basic laboratory experiments in pharmacology, biochemistry, medicinal chemistry, clinical chemistry, toxicology, microbiology, and pharmacokinetics are included and an interdisciplinary approach is used in many of the experiments. Prerequisites: 312-342 and P4 standing. Corequisites: 312-361, 373, 491.

495. LABORATORY IN THE BIOMEDICAL SCIENCES II (0+3) 1 hour
Prerequisites: 312-491, 312-494, and P-4 standing. Corequisite: 312-492.

496. LABORATORY IN THE BIOMEDICAL SCIENCES III (0+3) 1 hour
Prerequisites: 312-491, 312-495, and P-4 standing. Corequisite: 312-493.

502. PRINCIPLES AND PRACTICE OF PUBLIC HEALTH (3+0) 3 hours
Individual and community aspects of public hygiene, including infections, epidemiology, prophylaxis, and discussion of the major illnesses (nutritional, mental, environmental and occupational). Prerequisite: 312-361.

511. VETERINARY PHARMACY (2+0) 2 hours
The various pathological conditions peculiar to animals and the pharmaceuticals used in the treatment thereof. Prerequisite: Permission of instructor. (Formerly 311-511).

521. TOXICOLOGY (3+0) 3 hours
An introduction to the essential subject matter of clinical toxicology. Lectures, assigned readings in text and current literature and selected audio visual materials. Classification and mechanisms of drug and chemical toxicity; environmental, industrial, and household poisoning; emergency management of poisoning. Major emphasis will be on areas of clinical importance. Prerequisites: 312-492, 493; or permission of instructor. P-5 standing.

545. DRUGS OF ABUSE (2+0) 2 hours
Designed to assist the student in answering questions routinely asked about drugs that are abused. Emphasis is placed on recognition of the "street drugs," dosage forms, uses, and routes of administration; as well as related pharmacological and toxicological aspects of these drugs. Drug abuse awareness, drug abuse education, and drug abuse prevention. Prerequisite: 312-492 or permission of instructor.

565. RESEARCH IN PHARMACOLOGY AND/OR TOXICOLOGY 2-4 hours
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. Superior and advanced students are selected who intend to repeat the course for 2 to 3 years or pursue the same research problem(s) for pharmacy intern credit. Prerequisite: Permission of instructor.

571. SEMINAR IN PSYCHOPHARMACOLOGY (2+0) 2 hours
A seminar course involving student presentations of papers and discussions of topics of interest. Current papers in mental illness, psychedelic drug effects and pharmacological research are discussed. Prerequisites: 312-492 and P-5 standing.