



OHIO NORTHERN UNIVERSITY



CATALOG 2003-04

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## COLLEGE OF ARTS AND SCIENCES COURSES

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### ***Subject - General Arts and Sciences (AASG)***

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#### **001 - MEDICAL SCIENCES ORIENTATION**

##### *1.00 Credit*

Provides familiarity with general requirements and admissions standards for entry into colleges of medicine, dentistry, veterinary medicine, etc. Open to students interested in preparing for a career in these areas. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY. Graded S/U.

#### **002 - PRELAW ORIENTATION**

##### *1.00 Credit*

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

#### **003 - GENERAL SCIENCE ORIENTATION**

##### *1.00 Credit*

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

#### **005 - BASIC READING SKILLS**

##### *2.00 Credits*

Designed to increase reading proficiency by focusing on comprehension, vocabulary, reading speed, and study skills. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY. Prerequisite: Reading ACT score of 18 or below.

#### **010 - STUDY SKILLS**

##### *1.00 Credit*

To increase study efficiency by emphasizing improvement in motivation, concentration and memory. Attention is also given to selected study skills including time-management, listening, note taking, reading comprehension

and testing. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY. Open to freshmen and sophomores only.

#### **011 - COLLEGE READING SKILLS**

##### *2.00 Credits*

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

#### **012 - STRESS MANAGEMENT AND EFFECTIVE LIVING**

##### *1.00 Credit*

To provide students an opportunity to learn and adopt stress management skills that will enable them to lead more productive and satisfying lives. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY.

#### **100 - FRESHMAN SEMINAR**

##### *1.00 Credit*

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

#### **121 - CAREER EXPLORATION THROUGH PERSONAL ANALYSIS**

##### *1.00 Credit*

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

#### **190 - SPECIAL TOPICS**

##### *1.00 to 4.00 Credits*

Can be repeated as the topic varies. May be graded S/U as appropriate to the topic.

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**200 - TRANSFER STUDENT SEMINAR****1.00 Credit**

To orient transfer students to the academic, professional, personal, cultural and social opportunities available at ONU while simultaneously providing support and encouragement to this special group of students. Activities are designed to acquaint students with ONU services, to promote academic success, and to develop a sense of community with faculty, staff, and other transfer students. Graded S/U.

**290 - SPECIAL TOPICS****1.00 to 4.00 Credits**

Can be repeated as the topic varies. May be graded S/U as appropriate to the topic.

**297 - INDEPENDENT STUDY****1.00 to 4.00 Credits**

Can be repeated as the topic varies.

**300 - JOB AND GRADUATE SCHOOL SEARCH TECHNIQUES****1.00 Credit**

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

**390 - SPECIAL TOPICS****1.00 to 4.00 Credits**

Can be repeated as the topic varies. May be graded S/U as appropriate to the topic.

**490 - SPECIAL TOPICS****1.00 to 4.00 Credits**

Can be repeated as the topic varies. May be graded S/U as appropriate to the topic.

**497 - INDEPENDENT STUDY****1.00 to 4.00 Credits**

Can be repeated as the topic varies.

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**DEPARTMENT OF AERO-SPACE STUDIES**

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**Subject - Aerospace Studies (AERO)**

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

**111 - AIR FORCE ORGANIZATION 1****3.00 Credits**

Focuses on AF (Air Force) dress and appearance, military customs and courtesies. AF officer career opportunities and benefits awarded AF personnel are also addressed. A survey of Air Force heritage, AF organization and structure, and war and aerospace power is also taught. Leadership laboratory activities.

**112 - AIR FORCE ORGANIZATION 2****3.00 Credits**

Concentrates on furthering understanding of being an AF officer. This semester covers Air Force core values, communication skills, both written and oral, and team building. Also taught is an introduction to leading and managing the total force. Leadership laboratory activities.

**211 - AIR FORCE HISTORY 1****3.00 Credits**

Development of air power from the first lighter-than-air vehicles through to the establishment of the Department of the Air Force as an independent military force. Various concepts of employment of air power and factors which have prompted research and technological change. Examples of impact of air power on strategic thought. Leadership laboratory activities.

**212 - AIR FORCE HISTORY 2****3.00 Credits**

Development of air power since the establishment of the independent Air Force to the present. Various concepts of employment of air power and factors which have prompted research and technological change. Examples of impact of air power on strategic thought. Leadership laboratory activities.

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### **311 - AIR FORCE MANAGEMENT 1**

#### *5.00 Credits*

Integrated management course emphasizing individual as leader in the Air Force. Human behavior, individual and in groups, historical development of management thought, discussion of classical leadership theory, oral and written communication, military writing, and briefing formats. Leadership laboratory activities. Prerequisite: Departmental approval.

### **312 - AIR FORCE MANAGEMENT 2**

#### *5.00 Credits*

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

### **390 - SPECIAL TOPICS IN AEROSPACE STUDIES**

#### *1.00 to 6.00 Credits*

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

### **411 - AMERICAN NATIONAL SECURITY 1**

#### *5.00 Credits*

Role of the president, Congress and National Security Council in national security policy making; American defense strategy; alliances, regional security; arms control. Leadership Laboratory activities. Prerequisite: Departmental approval.

### **412 - AMERICAN NATIONAL SECURITY 2**

#### *5.00 Credits*

Air Force officer as part of national security forces; military law; laws of armed conflict; the military; profession; transition to military life; relations with civilian community. Leadership Laboratory activities. Prerequisite: Departmental approval.

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## **DEPARTMENT OF ARMY ROTC**

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### ***Subject - Army ROTC (ARMY)***

### **100 - LIFETIME LEADERSHIP SKILLS**

#### *3.00 Credits*

Skills needed to be successful in wide range of environments to include academic, corporate and military. Subjects include but not limited to time management, memory comprehension, effective and efficient reading and effective note taking. Extensive leadership studies of both corporate and military settings focuses on interpersonal skills, professional ethics and officership. No military obligation or prerequisites. Freshmen only.

### **101 - ROTC AND THE NATIONAL DEFENSE ORGANIZATION**

#### *3.00 Credits*

Background, programs, benefits and objectives of Army ROTC. Organization and functions of national defense establishment with emphasis on the role of the U.S. Army. Extensive discussion of the role and the responsibility of the military officer. Presentation of detailed information concerning career opportunities as an Army officer. No military obligation or prerequisite.

### **201 - ADVANCED LEADERSHIP**

#### *3.00 Credits*

Discussion and application of knowledge and skills needed in basic human survival situations in wilderness environments. Topics include land navigation, first aid, map reading, adverse weather conditions, finding shelter, water and food. No military obligation. Freshmen and sophomores only. Prerequisite: ARMY 101 or permission of instructor.

### **202 - MILITARY TACTICS**

#### *3.00 Credits*

Army tactics, principles of engagement and usage of military maps. Simulation exercises and war games will be utilized in class highlighting military tactics. No military obligation. Freshmen and sophomores only. Prerequisite: ARMY 201 or permission of instructor.

### **301 - PROFESSIONALISM/LEADERSHIP**

#### *4.00 Credits*

Professionalism and leadership required of the U.S. Army officer; application of leadership principles and styles through case studies and role-playing exercises with emphasis on military situations. Participation in leadership labs, physical training program and field training exercises required. Prerequisite: Department permission and completion of one of the following: ROTC basic course at BGSU; ROTC Basic Camp at Fort Knox, KY; prior Active Duty service; Army Reserve/ANG basic training.

## **302 - SMALL UNIT OPERATIONS**

### *5.00 Credits*

Organization and employment of basic military teams. Squad and platoon level tactical operations. Progressive leadership development through application of tactical principles. Participation in leadership labs, physical training program and field training exercises required. Prerequisite: ARMY 301.

## **390 - ARMY ROTC SPECIAL TOPICS IN MILITARY SCIENCE**

### *1.00 to 6.00 Credits*

Topics include but are not limited to: Study of selected military subjects; the profession of arms, leadership principles and styles, leadership assessment program, and participation in leadership labs and field training exercises. Credit may be granted for completion of Army ROTC Basic Camp at Ft. Knox, Kentucky. No Military obligation. Departmental permission required. Can be repeated as the topic varies.

## **401 - UNIT MANAGEMENT AND OFFICER DEVELOPMENT**

### *4.00 Credits*

Concepts and fundamentals of Army unit administration, supply and material readiness. Professional officership techniques and military ethics. Management at the small unit level. Organizing, planning and participating in field training exercises, participation in physical training and leadership labs. Prerequisite: 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.

## **402 - UNIT MANAGEMENT, MILITARY WRITING AND CORRESPONDENCE**

### *5.00 Credits*

Organization and concepts of the U.S. Army judicial system including court martial, nonjudicial and nonpunitive actions. Development of military writing techniques, preparation of staff papers and staff actions. Discussions of various administrative details pertinent to newly commissioned lieutenants. Participation in field training exercises, physical training and leadership labs. Prerequisite: ARMY 401.

## **470 - STUDIES IN MILITARY SCIENCE**

### *1.00 to 3.00 Credits*

Offered on demand. Detailed study of selected military subjects. Offered on lecture basis in seminar or independent study depending on students' needs and nature of material. May be repeated to six hours. Prerequisite: Consent of instructor. Formerly ARMY 471.

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## **DEPARTMENT OF ART**

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Associate Professor Greavu; Assistant Professors Eddings, Mancuso, Rowe (*Interim Chair*)

### **Mission Statement**

The Wilson Art Center integrates traditional and progressive approaches to the making of art and design. Our goal is to develop artists and designers as creative, productive and intellectually curious individuals capable of historical insight, critical thinking and technical proficiency in their area of emphasis.

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/her profession; (4) develops personal modes of expression in the media of the visual arts; and (5) acquires an awareness of and competency in other academic disciplines.

### **Portfolio Admission Requirement**

All prospective art majors must have a portfolio showing ability in drawing and design in any media. The portfolio will be requested during the admission process. Portfolios should consist of at least 10-15 slides or original two-dimensional works. Students may bring three-dimensional work to an interview, but will not be accepted via mail. Portfolios are evaluated by the department chair and other art faculty. For transfer students and other students changing a major to art, please contact the department at 419-772-2160.

### **Departmental Requirements**

Art majors with sophomore standing must participate in Sophomore Review during winter quarter. This is an opportunity for the art faculty to assess each students' artistic progress over the past four quarters.

All art majors are required to enter work in the annual student juried exhibition held each spring in the Elzay Gallery. Art majors with a junior standing are responsible for the organization and preparation of this show.

A public exhibition on campus is required of all graduating art majors pursuing either the Bachelor of Arts or Bachelor of Fine Arts degree. The exhibition is part of the senior capstone experience and is fulfilled under ART 489 - Senior Thesis. In addition to the exhibition, each student is required to write an extended thesis paper explaining their work and its historical significance, and present a slide presentation to the public during the opening reception of their show.

## Department Activities and Memberships

The art department is an active member of Kappa Pi International Art Honorary Fraternity. Art majors are eligible by maintaining a minimum 3.0 gpa in the art department and a minimum 2.5 gpa overall. The department holds additional memberships in the following professional organizations: AIGA (American Institute of Graphic Arts), UCDA (University and College Designers Association), NCECA (National Council on Education of Ceramic Arts), CAA (College Art Association), NASAD (National Association of Schools of Art and Design), and the Mid-American Print Council.

## Minors and Options

A minor or option outside of the department is encouraged but not required for majors. The following minors/options are most beneficial to the art major, regardless of the concentration:

**Museum Studies/Public History Minor**-see requirements under the Department of History, Political Science, and Criminal Justice.

### Virtual Simulation Minor or Multimedia

**Design and Development Option**- see requirements under the Department of Technological Studies.

**Public Relations Minor**- see requirements under the Department of Communications Arts.

### Business Option, Business Administration

**Minor or Marketing Minor**- see requirements under College of Arts and Sciences or the College of Business Administration.

## Art Education

ONU's teacher education program provides general education, subject area concentration, and professional educational experiences that will enable the student to enter the profession of teaching with competency. Admission and requirements are listed under the Center for Teacher Education.

## Bachelor of Arts degree with a major in art (77 hours)

### I. Concentration Requirements: (65 hours)

ART 100	Art
ART 150	Studio Foundations 1
ART 160	Studio Foundations 2
ART 170	Drawing Workshop
ART 210	Figure Drawing
ART 222	Graphic Design 1
ART 250	Painting 1
ART 251	Painting 2
ART 255	Ceramics 1
ART 265	Sculpture 1
ART 310	Art History 1
ART 320	Art History 2
ART 330	Art History 3
ART 360	Sculpture 2
ART 489	Senior Thesis (1 hour)

### Choose two:

ART 375	Printmaking- Intaglio
ART 377	Printmaking- Relief
ART 379	Printmaking- Silkscreen
ART 385	Printmaking- Lithography

## II. Art Electives (12 hours) Choose three courses:

ART 221	Jewelry
ART 223	Graphic Design 2
ART 340	Graphic Design 3
ART 341	Graphic Design 4
ART 350	Ceramics 2
ART 355	Watercolor
ART 365	Sculpture 3
ART 390	Special Topics in Art
ART 410	Advanced Ceramics
ART 415	Advanced Printmaking
ART 420	Advanced Painting
ART 494	Seminar in Art

## Art Minor (32 hours)

### I. Minor Requirements

ART 100	Art
ART 150	Studio Foundations 1
ART 160	Studio Foundations 2
ART 170	Drawing Workshop

### Choose one course:

ART 255	Ceramics 1
ART 265	Sculpture 1

### II. Minor Electives (12 hours) Choose three courses:

ART 210	Figure Drawing
ART 221	Jewelry
ART 222	Graphic Design 1
ART 223	Graphic Design 2
ART 250	Painting 1
ART 251	Painting 2
ART 255	Ceramics 1
ART 265	Sculpture 1
ART 310	Art History 1
ART 320	Art History 2
ART 330	Art History 3
ART 340	Graphic Design 3
ART 350	Ceramics 2
ART 360	Sculpture 2
ART 375	Printmaking- Intaglio
ART 385	Printmaking- Lithography

## Bachelor of Fine Arts degree (101-108 hours)

### I. Core Requirements (69 hours):

ART 100	Art
ART 150	Studio Foundations 1
ART 160	Studio Foundations 2
ART 170	Drawing Workshop
ART 210	Figure Drawing
ART 222	Graphic Design 1
ART 250	Painting 1
ART 251	Painting 2
ART 255	Ceramics 1
ART 265	Sculpture 1
ART 310	Art History 1
ART 320	Art History 2
ART 330	Art History 3
ART 350	Ceramics 2
ART 360	Sculpture 2
ART 489	Senior Thesis (1 hour)

### Choose two:

ART 375	Printmaking- Intaglio
ART 377	Printmaking- Relief
ART 379	Printmaking- Silkscreen
ART 385	Printmaking- Lithography

## **II. Concentration Requirements**

Studio Arts (minimum of 32 hours)  
(An area of emphasis must be selected from the following: ceramics, drawing, painting, printmaking, or sculpture. A minimum of 24 hours in area of emphasis is required plus 8 hours of electives.)

ART 210	Figure Drawing
ART 221	Jewelry
ART 355	Watercolor
ART 365	Sculpture 3
ART 410	Advanced Ceramics
ART 415	Advanced Printmaking
ART 420	Advanced Painting
ART 490	Special Topics in Art
ART 494	Seminar in Art
ART 497	Independent Study in Art

Graphic Design (39 hours)

ART 223	Graphic Design 2
TECH 240	Introduction to Communication Technology
ART 340	Graphic Design 3
ART 341	Graphic Design 4
TECH 341	Photography
ART 440	Graphic Design 5
ART 471	Internship (16 hours)

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## **Subject - Art (ART)** \_\_\_\_\_

### **000 - ORIENTATION**

#### **1.00 Credit**

Familiarization with the department, requirements for majors, planning program of courses, university catalog, and library. Required of all majors in the department. Graded S/U.

### **100 - ART**

#### **4.00 Credits**

Analysis of the visual arts through selected works from the past and present. Illustrated lecture.

### **150 - STUDIO FOUNDATIONS 1**

#### **4.00 Credits**

Methods of drawing with an emphasis on the elements and principles of design and linear perspective.

### **160 - STUDIO FOUNDATIONS 2**

#### **4.00 Credits**

Drawing 3-dimensional forms in space, color theory, introduction to the elements and principles of 3-D design. Prerequisite: ART 150.

### **170 - DRAWING WORKSHOP**

#### **4.00 Credits**

Complex problems, thematic development, figure drawing, special papers and methods. May repeat to 8 credits.

### **190 - SPECIAL TOPICS IN ART**

#### **1.00 to 4.00 Credits**

### **210 - FIGURE DRAWING**

#### **4.00 Credits**

Drawing and anatomical study of the human figure. May repeat for a total of 12 hours. Prerequisites: ART 170 or permission of the instructor.

### **221 - JEWELRY**

#### **4.00 Credits**

Use of a variety of materials in the making of jewelry. Emphasis on design and the development of technical skills. May repeat to 8 credits.

### **222 - GRAPHIC DESIGN 1: INTRODUCTORY VISUAL COMMUNICATION**

#### **4.00 Credits**

The basic methods, processes, language, visual principles and theory of working in two-dimensional communication design. Emphasis on problem analysis, creative concept development, analytical and technical skills. Note: Course does not include computer training.

### **223 - GRAPHIC DESIGN 2: TYPOGRAPHY**

#### **4.00 Credits**

Typography, examining typographic changes brought about through cultural, political and sociological influences; language theories; and technological development. Integrates lessons from the past with contemporary theory and technology. Lectures based on four language components: letter and word, sentence and meaning, language and structure, text and textuality. Prerequisite: ART 222.

### **250 - PAINTING 1**

#### **4.00 Credits**

Techniques and modes of painting in oil. Emphasis on color mixing and painting from direct observation.

### **251 - PAINTING 2**

#### **4.00 Credits**

Techniques and modes of painting in oil. May repeat for a total of 12 hours. Prerequisite: ART 250.

### **255 - CERAMICS 1**

#### **4.00 Credits**

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

### **265 - SCULPTURE 1**

#### **4.00 Credits**

The design and rendering of sculptural form in a variety of media and techniques. Emphasis on organizational problems of form and space.

### **290 - SPECIAL TOPICS IN ART**

#### **1.00 to 4.00 Credits**

### **310 - ART HISTORY 1**

#### **4.00 Credits**

Prehistoric to 14th century art, European and Near Eastern forms, developments and styles. Prerequisite: Sophomore status or permission of instructor.



### **320 - ART HISTORY 2**

#### *4.00 Credits*

European painting, sculpture and architecture from the 15th through the first half of the 19th century. Prerequisite: ART 310.

### **330 - ART HISTORY 3**

#### *4.00 Credits*

The formation and development of major artistic movements in Europe and the United States from 1860 to the present. Prerequisite: ART 320.

### **340 - GRAPHIC DESIGN 3: NARRATIVE**

#### *4.00 Credits*

An exploration of the nature and practice of visual communication as a story-telling and framing activity in print media from a historical perspective.

Emphasis is on research, concept development and technical skills. Prerequisite: ART 223.

### **341 - GRAPHIC DESIGN 4: IDENTITY**

#### *4.00 Credits*

Investigation of comprehensive applied problems in visual communication addressing identity programs and consumer-oriented design. Emphasis on branding and system design. Prerequisite: ART 340.

### **350 - CERAMICS 2**

#### *4.00 Credits*

Methods and techniques of forming, decorating, glazing and firing clay bodies. Emphasis on wheel throwing. May repeat for a total of 8 hours. Prerequisite: ART 255.

### **355 - WATERCOLOR**

#### *4.00 Credits*

Techniques and modes of painting in aqueous media. May repeat for a total of 8 hours. Prerequisites: ART 160 or permission of the instructor.

### **360 - SCULPTURE 2**

#### *4.00 Credits*

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

### **365 - SCULPTURE 3**

#### *4.00 Credits*

Use of metals, oxyacetylene welding of steel, lost wax casting of bronze. May repeat for a total of 12 hours. Prerequisites: ART 360 or permission of instructor.

### **375 - PRINTMAKING - INTAGLIO**

#### *4.00 Credits*

Methods and techniques of intaglio process. Includes drypoint, aquatint, mezzotint, hard and soft grounds, spit bite and sugar lifts. Prerequisites: ART 170 or permission of instructor.

### **377 - PRINTMAKING - RELIEF**

#### *4.00 Credits*

Methods and techniques of relief process. Includes woodcut, linoleum cut and reduction methods with color. Prerequisites: ART 170 or permission of instructor. Corequisite: Junior or senior standing.

### **379 - PRINTMAKING - SILKSCREEN**

#### *4.00 Credits*

Methods and techniques of the silkscreening process. Includes stencils and photo-emulsion techniques. Prerequisites: ART 170 or permission of instructor. Corequisite: junior or senior standing.

### **385 - PRINTMAKING - LITHOGRAPHY**

#### *4.00 Credits*

Methods and techniques of lithography. Both plate and stone lithographic processes. Prerequisites: ART 170 or permission of instructor.

### **390 - SPECIAL TOPICS IN ART**

#### *1.00 to 4.00 Credits*

### **410 - ADVANCED CERAMICS**

#### *4.00 Credits*

Directed study. May repeat to total credit of 12 hours. Prerequisite: 8 hours of ART 350.

### **415 - ADVANCED PRINTMAKING**

#### *4.00 Credits*

Directed study. May repeat to total credit of 12 hours. Prerequisite: 8 hours of ART 375 and/or 385.

### **420 - ADVANCED PAINTING**

#### *4.00 Credits*

Directed study. May repeat to total credit of 12 hours. Prerequisite: ART 251.

### **440 - GRAPHIC DESIGN 5: PERSUASIVE DESIGN**

#### *4.00 Credits*

Examination of form and content that shape persuasive communication, including the commercial, political and social contexts of design artifacts. Students study persuasive strategies, critical techniques and ethical issues in shaping design. Assignments emphasize extensive research, design theory and history, professional presentation skills, and cultivation and demonstration of relationships between form, function, content, context and meaning. Prerequisite: ART 341.

## 471 - INTERNSHIP

### 8.00 to 16.00 Credits

Supervised field experience in an approved commercial art studio, design agency, design department, museum, gallery or arts organization. Application must be made through the advisor no later than one full quarter in advance of enrollment. A visual presentation to the art department after completion of internship is required. Prerequisites: Junior or senior rank; ART 160 and 222; and permission of the department.

## 489 - SENIOR THESIS

### 1.00 Credit

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

## 490 - SPECIAL TOPICS IN ART

### 1.00 to 4.00 Credits

## 494 - SEMINAR IN ART

### 1.00 to 4.00 Credits

## 497 - INDEPENDENT STUDY IN ART

### 1.00 to 4.00 Credits

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# DEPARTMENT OF BIOLOGICAL SCIENCES

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Professors Anderson, Hoagstrom, Keiser (*Chair*), Young; Associate Professors Aulthouse, Suniga, Swanson, Woodley; Assistant Professors Connour, Moncayo, Torres, Verb; Visiting Assistant Professor McClellan; Clinical Instructor Calvo (shared); Instructor Keas; Visiting Instructor Geier; Assistant Instructor MaGaw; Laboratory Technician Brachok; Adjunct Faculty Bathalon, Carmichael, Crawford, Decanio, Fought, Frame-Bibler, Harris, Johnson, Lange, Meyer, Moser, Reed, Schieltz, Sherrick, Shriber, Sreenan

### Mission Statement

The mission of the department is to provide each student with an environment in which to learn, understand and investigate the science of biology and to be able to apply these skills to the technological world of today.

Students majoring in the department will be exposed to a wide range of academic disciplines within biology and environmental studies, including current instrumentation and research techniques and written and oral scientific communication methods. Biology 121 is a principles course with a major emphasis on the study of the cell, genetics, evolution, and ecology. It provides generalizations by which advanced courses in biology can be related to one another and is therefore a prerequisite to all other courses in the curriculum. Students desiring further

knowledge of general biology may take Biology 122 which surveys the animal kingdom, and Biology 123 which explores general botany and the fungi. These courses also provide a firm foundation for advanced work in biology and the related applied sciences.

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

## Special Requirements

1. AASG 300 -- JOB & GRADUATE SCHOOL SEARCH TECHNIQUES. Successful completion of AASG 300 -- Job and Graduate School Search Techniques, is required for all majors. Students must have a minimum of junior status to enroll in the course; three or four sections are offered fall, winter and spring quarters. It is recommended that students planning to attend graduate/professional school complete the course by no later than fall quarter of their graduating year; biological sciences students who are also pre-med are advised to take the course spring quarter of their junior year. Students seeking employment are advised to complete the course no later than winter quarter of their graduating year.
2. Minimum 2.00 cumulative GPA in all biology courses.
3. All courses in **core** requirements must have a "C" grade or better for satisfactory completion of requirements.

## CO-OP program in the Biological Sciences

Professional experience in a biologically or environmentally-related occupation with a governmental, consulting or industrial entity. Opportunities to interact with professional scientists in an employer-employee context. The 'normal' academic program of students choosing the CO-OP program will be five years rather than the four-year degree. CO-OP program students will spend a total of four ten week terms of employee/intern activity with the CO-OP agency. These CO-OP activities will be interspersed with regular academic terms on campus enrolled as full-time student. Junior status and approval of the department chair is required for participation in the CO-OP program.

## Major in Biology

### Core Requirements:

BIOL 121	General Biology
BIOL 122	Intro. to Zoology
BIOL 123	General Botany
BIOL 195	Orientation

*"Capstone Experience"*

Choose one course or sequence:

- BIOL 494 Biology Senior Seminar
- BIOL 295, Research Sequence
- 395, 495

*Molecular/Cellular Course*

Choose one course:

- BIOL 210 Introductory Genetics
- BIOL 217 Intro. to Molecular Biology
- BIOL 351 Cell Biology

*Physiology/Anatomy Course*

Choose one course:

- BIOL 231 Anatomy and Physiology
- BIOL 301 Developmental Anatomy
- BIOL 302 Human Anatomy
- BIOL 308 Plant Anatomy
- BIOL 310 Plant Physiology
- BIOL 331 Physiology 1

(All must include a laboratory component)

*Field Biology/Ecology Course*

Choose one course:

- BIOL 213 Natural History
- BIOL 251 Principles of Ecology
- BIOL 271 Intro. to Marine Biology

*Systematics/Evolution Course*

Choose one course:

- BIOL 204 Systematic Plant Survey
- BIOL 223 Invertebrate Zoology

OR

Choose two courses:

- BIOL 363 Ornithology
- BIOL 364 Herpetology
- BIOL 368 Ichthyology
- BIOL 490 Mammalogy

The biology elective hours are chosen from among the following courses excluding those which have been taken as required core courses above:

- BIOL 201 Environment and Man
- BIOL 204 Systematic Plant Survey
- BIOL 210 Introductory Genetics
- BIOL 213 Natural History
- BIOL 217 Intro. to Molecular Biology
- BIOL 223 Invertebrate Zoology
- BIOL 231-32 Anatomy & Physiology 1,2
- BIOL 251 Principles of Ecology
- BIOL 263 Biogeography
- BIOL 271 Intro. to Marine Biology
- BIOL 290 Special Topics in Biology
- BIOL 301 Developmental Anatomy
- BIOL 302 Human Anatomy
- BIOL 303 Histology
- BIOL 305 Environmental Toxicology
- BIOL 308 Vascular Plant Anatomy
- BIOL 310 Plant Physiology
- BIOL 311 Microbiology
- BIOL 315 Medical Terminology
- BIOL 321 Intro. to Immunology
- BIOL 331-32-33 Physiology 1,2,3

- BIOL 334-35-36 Physiology Labs 1,2,3
  - BIOL 343 Histological Techniques
  - BIOL 351 Cell Biology
  - BIOL 360 North American Mammals
  - BIOL 361 Entomology
  - BIOL 362 Parasitology
  - BIOL 363 Ornithology
  - BIOL 364 Herpetology
  - BIOL 366 Radiation Biology
  - BIOL 368 Ichthyology
  - BIOL 371 Advanced Marine Biology
  - BIOL 372 Topics in Marine Biology
  - BIOL 383 Animal Behavior (Ethology)
  - BIOL 397\* Self Directed Studies in the Biological Sciences
  - BIOL 423 Topics in Ecology and Biogeography
  - BIOL 451 Advanced Topics in Cell Biology
  - BIOL 481\* Internship Program
  - BIOL 490 Special Topics in Biological Sciences
  - BIOL 497\* Independent Study in Biology
- \*Individually or collectively may count for only 7 hours of the 16 biology elective hours.-

Credit cannot be granted for both 231 and 331 or 232 and 332.

A minimum of 47 biology hours is required for both the B.S. and B.A. degree.

Departmental advisors will assist students in selecting relevant electives.

**B.S. Degree - Required Cognates (32 hrs.)**

One year in chemistry  
One year in mathematics  
One course in computer science (cannot be a web design course)

**PLUS** one additional science course (geology, physics, astronomy or chemistry). Specific science courses taught in the College of Engineering are acceptable cognates. Kinesiology (HPES 223) offered by the department of human performance and sport sciences may count with permission of the biological sciences faculty.

**B.S. Degree - Additional Requirements**

Any additional courses in Biology, Chemistry, Mathematics, Physics, or GEOL 280 (20 hours)\*\*

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

**B.A. Degree - Required Cognates (25 hrs.)**

One year in chemistry  
Two courses in mathematics  
One course in computer science (cannot be a web design course), physics, or an additional mathematics course.

## Major in Environmental Studies

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

### Core Requirements:

BIOL 121	General Biology
BIOL 122	Intro. to Zoology
BIOL 123	General Botany
BIOL 195	Orientation
BIOL 201	Environment and Man
BIOL 213	Natural History
BIOL 223	Invertebrate Zoology
BIOL 240	OSHA-40-Hour Safety Training
BIOL 251	Principles of Ecology
BIOL 305	Environmental Toxicology
BIOL 311	Microbiology
BIOL 482	Internship

### PLUS Any two of the following:

BIOL 361	Entomology
BIOL 363	Ornithology
BIOL 364	Herpetology
BIOL 366	Radiation Biology
BIOL 368	Ichthyology
BIOL 490	Mammalogy
BIOL 490	Plant Taxonomy

Additional biology electives may also be added (see list of electives under Major in Biology).

### Required Cognates:

GEOL 280	Geology
PLSC 306	Environmental Law
PHIL 310	Environmental Ethics
CE 203	Surveying
CE 321	Environmental Science
CE 323	Solid and Hazardous Waste Management
CE 371	Urban Planning
MGMT 333	Management and Organizational Behavior
GEOG 248	Intro. to GIS

One year of chemistry including

CHEM 115	Environmental Chemistry
PHYS 100	Physics

### OR

PHYS 211	General Physics: Mechanics of Solids and Fluids
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PLUS one year in mathematics

PLUS Six courses in the social sciences, business or public relations (must be advisor approved)

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

## Major in Molecular Biology

A major in Molecular Biology provides the necessary training for students to pursue careers in the biotechnology industry and research in cell and molecular biology and provides excellent preparation for graduate and medical school. All core and cognate requirements must have a grade of C or better.

### Core Requirements:

BIOL 121	General Biology
BIOL 122	Intro. to Zoology
BIOL 123	General Botany
BIOL 195	Orientation
BIOL 210	Introductory Genetics
BIOL 217	Intro. to Molecular Biology
BIOL 311	Microbiology
BIOL 351	Cell Biology
BIOL 451	Adv. Topics in Cell Biology
CHEM 251-52-53	Organic Chemistry 1, 2, 3
CHEM 311	Chem. Of Biological Molecules
CHEM 312	Chemistry of Metabolism
CHEM 414-15-16	Biochemistry Laboratory 1, 2, 3

### PLUS one of the Research Sequences below:

BIOL 295, 395, 495
CHEM 481, 482, 483

### Required Cognates:

CHEM 171-72-73	Introductory Chemistry 1, 2, 3
One year in mathematics (preferable sequence)	
MATH 163-64-65	Calculus 1, 2, 3

PLUS One course in computer science (cannot be a web design course)

### PLUS

PHYS 211	General Physics: Mechanics of Solids and Fluids
PHYS 212	General Physics: Sound, Heat, and Light
PHYS 213	General Physics: Electricity and Magnetism

(all with labs)

### OR

PHYS 231	Physics: Mechanics of Solids and Fluids
PHYS 232	Physics: Heat, Sound, and Light
PHYS 233	Physics: Electricity and Magnetism

(all with labs)

## Life Science Licensure with a Major in Biology

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

### Biology Requirements:

BIOL 121	General Biology
BIOL 122	Intro. to Zoology
BIOL 123	General Botany
BIOL 204	Systematic Plant Survey
BIOL 210	Introductory Genetics
BIOL 223	Invertebrate Zoology
BIOL 251	Principles of Ecology
BIOL 311	Microbiology
BIOL 351	Cell Biology

One of the following:

BIOL 231	Anatomy and Physiology 1
BIOL 301	Developmental Anatomy
BIOL 302	Human Anatomy
BIOL 331 + 334	Physiology 1 and Physiology Lab 1

**PLUS** the Biology Research Sequence

BIOL 295, 395, 495

And a minimum of 5 quarter hours of biology electives not included above. (See list of electives under Major in Biology.)

**Science Cognates:** (Minimum 24 qtr. hrs.)

CHEM 171-72-73 Introductory Chemistry 1, 2, 3

One of the following:

PHYS 100	Physics
PHYS 211 (with lab)	General Physics: Mechanics of Solids and Fluids
PHYS 231 (with lab)	Physics: Mechanics of Solids and Fluids

**PLUS** one of the following:

PHYS 252	Earth Science and Plan- etary Astronomy
GEOL 280	Geology

Additional electives in biology, chemistry, physics and/or earth science must be selected to complete a total of 75 quarter hours of science.

### Math Cognates:

Three courses in mathematics which must include at least one of the following:

MATH 122	College Trigonometry
MATH 154	Calculus for Life Sciences 1
MATH 161	Calculus 1A/Pre-Calculus
MATH 163	Calculus 1

**PLUS** one course in computer science (cannot be a web design course)

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

## Biological Sciences Minors

Students who would like to add a minor to their major must see the department chair for permission. If granted, the student with a major in Biology may add an Environmental Studies, a Biomedical Sciences or a Field Biology minor by taking all the required courses for the major and chosen minor **plus twelve additional quarter hours** in biology applicable to either the major or minor. This will be a minimum of 59 quarter hours of biology.

**Environmental Studies majors** may add a biology or biomedical sciences minor with permission of the department chair, and completing all the requirements of their major and of the chosen minor. **Environmental Studies majors** may also add a field biology minor with permission of the department chair by taking all the requirements of their major and minor **plus twelve additional quarter hours in biology** applicable to either the major or minor.

**Molecular Biology majors** may add a minor in environmental studies, biomedical sciences or a field biology minor with permission of the department chair, and by taking all required courses for their major and chosen minor **plus twelve quarter hours** in biology applicable to either the major or minor.

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

Students pursuing a degree in **Clinical Laboratory Science (BSCLS)** may add a biology, environmental studies or field biology minor with the permission of the department chair and by taking all the requirements in their program and the chosen minor.

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

**Core Requirements** (28 qtr. hrs.)

BIOL 121	General Biology
BIOL 122	Intro. to Zoology
BIOL 123	General Botany

### *Molecular/Cellular Course*

Choose one course:

BIOL 210	Introductory Genetics
BIOL 217	Intro. to Molecular Biology
BIOL 351	Cell Biology

### *Physiology/Anatomy Course*

Choose one course:

BIOL 231	Anatomy and Physiology
BIOL 301	Developmental Anatomy
BIOL 302	Human Anatomy
BIOL 308	Vascular Plant Anatomy
BIOL 310	Plant Physiology
BIOL 331	Physiology 1

(All must include a laboratory component)

### *Field Biology/Ecology Course*

Choose one course:

BIOL 213	Natural History
BIOL 251	Principles of Ecology
BIOL 271	Intro. to Marine Biology

### *Systematics/Evolution Course*

Choose one course:

BIOL 204	Systematic Plant Survey
BIOL 223	Invertebrate Zoology

### **OR**

Choose two courses:

BIOL 363	Ornithology
BIOL 364	Herpetology
BIOL 368	Ichthyology
BIOL 490	Mammalogy

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

### **Required Cognates** (12 qtr. hrs.)

Any combination of mathematics, chemistry, physics, or GEOL 280.

## **Minor in Biomedical Sciences**

(Minimum of 30 qtr. hrs. of Biology)

### **Core Requirements** (28 qtr. hrs.)

BIOL 121	General Biology
BIOL 122	Intro. to Zoology
BIOL 124	Intro. to Human Anatomy and Histology

### **PLUS**

BIOL 231-32	Anatomy and Physiology 1, 2
BIOL 331-32-33	Physiology 1, 2, 3, (all with labs)

### **PLUS**

BIOL 301	Developmental Anatomy
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### **OR**

BIOL 302	Human Anatomy
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Additional Biology hours (at least 2 hours) must be selected from the following electives not selected from the above:

BIOL 210	Introductory Genetics
BIOL 301	Developmental Anatomy
BIOL 302	Human Anatomy
BIOL 303	Histology
BIOL 311	Microbiology
BIOL 321	Intro. to Immunology
BIOL 351	Cell Biology
BIOL 362	Parasitology

### **Required Cognates** (12 qtr. hrs.)

Any combination of mathematics, chemistry, or physics.

## **Minor in Environmental Studies**

(Minimum 30 qtr. hrs. of Biology)

### **Core Requirements** (30 qtr. hrs.)

BIOL 121	General Biology
BIOL 122	Intro. to Zoology
BIOL 123	General Botany
BIOL 201	Environment and Man
BIOL 251	Principles of Ecology
BIOL 305	Environmental Toxicology
BIOL 311	Microbiology
PLSC 306	Environmental Law

### **Required Cognates** (12 qtr. hrs.)

Any combination of mathematics, chemistry, physics, or GEOL 280

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

### **Core Requirements** (24 qtr. hrs.)

BIOL 121	General Biology
BIOL 122	Intro. to Zoology
BIOL 123	General Botany

### **PLUS**

BIOL 213	Natural History
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### **OR**

BIOL 251	Principles of Ecology
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**PLUS** any two of the following (not included above):

BIOL 213	Natural History
BIOL 251	Principles of Ecology
BIOL 271	Intro. to Marine Biology
BIOL 361	Entomology
BIOL 363	Ornithology
BIOL 364	Herpetology
BIOL 368	Ichthyology
BIOL 490	Mammalogy
BIOL 490	Plant Taxonomy

Additional Biology hours (at least 6 hours) must be selected from the following electives not selected from the above:

BIOL 204	Systematic Plant Survey
BIOL 213	Natural History
BIOL 223	Invertebrate Zoology
BIOL 251	Principles of Ecology
BIOL 263	Biogeography
BIOL 271	Intro. to Marine Biology
BIOL 360	North American Mammals
BIOL 361	Entomology
BIOL 363	Ornithology
BIOL 364	Herpetology
BIOL 368	Ichthyology
BIOL 383	Animal Behavior (Ethology)
BIOL 490	Mammalogy
BIOL 490	Plant Taxonomy

### **Required Cognates** (12 qtr. hrs.)

Any combination of mathematics, chemistry, physics, or GEOL 280.

The **Ohio Northern University Metzger Nature Center**, a 70-acre property in Tuscarawas County, Ohio, serves as a biology field station. The facility is located near Ragersville, and includes a century-old

farm house and a new academic residence center. Laboratories, computer labs, room and board facilities are part of the complex. The hills, valleys, woods, fields, stream, and pond provide an excellent opportunity for teaching, study, and research.

The department also maintains a nearly 300 acre Wetlands Restoration Project bordering the Scioto River and Scioto Marsh only 12 miles from the campus.

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

## Business Option

A business option with a management emphasis is available for any student majoring in biology or environmental studies or for students in the clinical laboratory science program. **See Business Options under Arts and Sciences description.**

## Criminal Justice (Forensics) Option

This option is designed for those students with a biology or molecular biology major and an interest in forensics. Students must take the following courses in addition to completing the biology requirements:

PLSC 121	Intro to Criminal Justice
PLSC 122	Police in America
PLSC 211	Forensic Science 1
PLSC 212	Forensic Science 2
SOC 261	Criminology
PLSC 351	Constitutional Law and Civil Liberties
PLSC 355	Minorities and Women in Criminal Justice

## CLINICAL LABORATORY SCIENCE PROGRAM

The department of biological sciences offers a program of study culminating in a Bachelor of Science degree in Clinical Laboratory Science (BSCLS). This degree program is designed for students who seek a baccalaureate degree and professional certification in clinical laboratory science (CLS). In addition, the department offers a post baccalaureate certificate in CLS. The certificate is designed for individuals with a baccalaureate degree and who have completed required coursework in biology, chemistry and mathematics. Graduates and those who complete the certificate may pursue career opportunities in various laboratory settings

including clinical, industrial and public health or choose to continue their education in graduate or professional school (medical, dental, etc.).

## The BSCLS Degree

The BSCLS degree at ONU centers on student learning using community-partnered curriculum. Two tracks of study are offered.

### 3+1, single major (CLS): 196-201 Quarter Hours

Students pursuing the 3+1 track are expected to complete all degree requirements including (a) a minimum of 52 quarter hours of approved general education coursework, (b) a minimum of 53 quarter hours of biology requisites, (c) a minimum of 31 quarter hours of chemistry cognates, (d) participation in the college assessment program, and (e) a minimum of 60 quarter hours of clinical laboratory science core coursework.

### 4+1, double major (Biology and CLS): 254-258 Quarter Hours

Students pursuing the 4+1 track are expected to complete all degree requirements for both majors including (a) a minimum of 68 quarter hours of approved general education coursework and electives, (b) a minimum of 51 quarter hours of biology requisites, (c) a minimum of 31 quarter hours of chemistry and science cognates, (d) participation in the college assessment program, and (e) a minimum of 60 quarter hours of clinical laboratory science coursework.

Students who successfully complete all degree requirements of the 3+1 track are awarded a B.S. in Clinical Laboratory Science. Students who successfully complete all degree requirements of the 4+1 track are awarded two degrees: a B.S. in Biology and a B.S. in Clinical Laboratory Science. All graduates are eligible to seek professional certification from the American Society for Clinical Pathology (ASCP) and/or the National Certification Agency for Laboratory Personnel (NCA).

### Coursework for the 3+1 BSCLS Track

General Education	Hours
English 110, 111, and 204	12
Communication 211 or 225	4
History 110	4
Religion XXX	4
Psychology 100	4
Fine Arts XXX	4
Non-Western Culture XXX	4
Mathematics XXX (120 or above)	4
Statistics XXX	4
Computer Science (no web design)	4
Physical Education (Fitness, Life Skills, Wellness)	3
AASG 300 Job & Graduate School Search Techniques	1
Participation in College Assessment Program	N/A

<b>Biology Core</b>		Psychology 100	4
BIOL 121 General Biology	4	Fine Arts	4
BIOL 122 Intro. to Zoology	4	Non-Western Culture XXX	4
BIOL 124 Intro. to Human Anatomy and Histology	4	Social Science elective	4
BIOL 195 Orientation	1	Mathematics XXX (120 or above)	8
BIOL 210 Introductory Genetics	4	Statistics XXX	4
BIOL 217 Intro. to Molecular Biology	4	Computer Science (no web design)	4
BIOL 223 Invertebrate Zoology	4	Physical Education (Fitness, Life Skills, Wellness)	3
BIOL 301 Developmental Anatomy	4	AASG 300 Job & Graduate School Search Techniques	1
BIOL 303 Histology	4	Participation in College Assessment Program	N/A
BIOL 311 Microbiology	4	Completion of All Major(s) Requirements	N/A
BIOL 321 Intro. to Immunology	4		
BIOL 331 Physiology 1	3		
BIOL 334 Physiology Lab	1		
BIOL 343 Histological Techniques	3		
BIOL 362 Parasitology	4		
BIOL 494 Biology Senior Seminar	1-3		
<b>or</b>			
BIOL Research Sequence (295, 395, 495)			
Biology electives	2-4		
<b>Chemistry Cognates</b>		<b>Biology Core</b>	
CHEM 171-173 Introductory Chemistry 1,2,3	15	BIOL 121 General Biology	4
CHEM 251-253 Organic Chemistry 1, 2, 3	12	BIOL 122 Intro. to Zoology	4
PHBS 341 Biochemistry 1	4	BIOL 123 General Botany	4
		BIOL 124 Intro. to Human Anatomy and Histology	4
		BIOL 195 Orientation	1
		BIOL 210 Introductory Genetics	4
		BIOL 213, 251 <b>or</b> 271 (Field Biology/ Ecology Course)	4
		BIOL 217 Intro. to Molecular Biology	4
		BIOL 223 Invertebrate Zoology	4
		BIOL 301 Developmental Anatomy	4
		BIOL 302 Human Anatomy	4
		BIOL 303 Histology	4
		BIOL 311 Microbiology	4
		BIOL 321 Intro. to Immunology	4
		BIOL 331 Physiology 1 w/ lab (BIOL 334)	4
		BIOL 332 Physiology 2	3
		BIOL 333 Physiology 3	3
		BIOL 343 Histological Techniques	3
		BIOL 362 Parasitology	4
		BIOL 481 Internship Program	16
		BIOL 494 Biology Senior Seminar	1
		<b>OR</b>	
		BIOL Research Sequence (295, 395, 495)	3
		Elective (Biology)	4
		<b>Chemistry and Science Cognates</b>	
		CHEM 171-173 Introductory Chemistry 1,2,3	15
		CHEM 251-253 Organic Chemistry 1, 2, 3	12
		PHBS 341 Biochemistry 1	4
		PHYS 120 Physics w/Health Science Applications	4
		<b>Clinical Laboratory Science Core</b>	
		Same as for the 3+1 track	
		<b>Additional Curriculum Information</b>	
		1. Students have the choice of taking the BIOL 295 (literature research), BIOL 395 (biological research report), BIOL 495 (senior thesis seminar) research sequence or the BIOL 494 (senior seminar) course to satisfy the senior capstone requirement. The research sequence is preferred.	
<b>Coursework for the 4+1 Dual Degree (BSCLS/BS Biology) Track</b>			
<b>General Education</b>	<b>Hours</b>		
English 110, 111, and 204	12		
Communication 211 <i>or</i> 225	4		
History 110 <b>and</b> 111	8		
Philosophy XXX	4		
Religion XXX	4		



- Biology electives include BIOL 315 (Medical Terminology), BIOL 335, BIOL 336, BIOL 351 (Cell Biology), BIOL 366 (Radiation Biology), and BIOL 451 (Advanced Topics in Cell Biology).
- Completion of one additional **qualifying chemistry course** may enable a student completing the chemistry requirements of the 4+1 track to take a chemistry minor. Students interested in this option should consult with CLS program director or education coordinator for information on qualifying course(s).
- In consultation with their academic advisor, BSCLS students should consider MUSC 200 (Non-Western Music) or RELG 2XX to meet the non-western and fine arts or religion general education requirement thereby maximizing schedule flexibility.

CLS 474 Case Studies in Clinical Laboratory Science	1
CLS 490 Special Topics in Clinical Laboratory Science	1-4
<b>Subtotal</b>	<b>60-63</b>

### Clinical Training Requirement

All clinical laboratory science program students (degree or certificate) are required to apply for admission to and successfully complete a clinical training program. Students admitted to ONU's West Central Ohio CLS program continue their didactic coursework in the department of biological sciences and complete clinical training at Lima Memorial Hospital, Lima, Ohio. For more information on the clinical training requirement, contact the West Central Ohio Clinical Laboratory Science Program Director at (419) 772-3084 or visit the program website at <http://www2.onu.edu/~c-calvo>.

### The Post Baccalaureate Certificate in Clinical Laboratory Science

The ONU post baccalaureate certificate in CLS focuses on educating academically qualified individuals in the clinical laboratory sciences using community-partnered curriculum. Specifically, students must complete a minimum of 60 quarter hours of clinical laboratory science core coursework including a supervised applied clinical experience. Those wishing to pursue the certificate must possess a baccalaureate degree from an accredited college or university and have completed requisite coursework in biology, chemistry, mathematics and computer science. Courses cannot be survey or remedial ones and must have been completed within seven years prior to beginning coursework at ONU. Upon satisfactory completion of the prescribed course of study, students receive a certificate in CLS and are eligible to seek professional certification from the American Society for Clinical Pathology (ASCP) and/or National Certification Agency for Laboratory Personnel (NCA).

### Post Baccalaureate Certificate Courses

	Hours
CLS 460 Foundations of Clinical Laboratory Science	3
CLS 461 Professional Practice and Development	3
CLS 462 Biological Fluids	3
CLS 463 Clinical Immunology	3
CLS 464 Hematology and Hemostasis	4
CLS 465 Blood Banking and Transfusion Science	4
CLS 466 Clinical Chemistry	4
CLS 467 Clinical Microbiology	5
CLS 468 Clinical Laboratory Practicum Orientation	2
CLS 469 Clinical Hematology Practicum	6
CLS 470 Blood Bank Practicum	6
CLS 471 Clinical Chemistry Practicum	6
CLS 472 Clinical Microbiology Practicum	6
CLS 473 Immunology & Infectious Diseases Practicum	3

### West Central Ohio Clinical Laboratory Science Program

The West Central Ohio Clinical Laboratory Science Program is Ohio Northern University's resident four-quarter capstone experience for those pursuing the BSCLS degree or the post baccalaureate certificate. During the first two quarters, students admitted to the program complete didactic coursework in clinical laboratory science theory and practice, hematology, clinical chemistry, clinical microbiology, clinical immunology, clinical immunohematology, biological fluids, professional practice and development. The students complete their last two quarters of clinical coursework at Lima Memorial Hospital's Clinical Laboratory.

### Mission Statement

The mission of the West Central Ohio Clinical Laboratory Science Program is to educate students in the clinical laboratory sciences, preparing them to practice as ethical and competent professionals, and enabling them to meet whatever job-related challenges arise now and in the future.

### Overview of the Program Admission Requirements

The West Central Ohio Clinical Laboratory Science Program has an enrollment capacity of 8 students per year. The start date for the program is June. Prospective students may submit applications at any time but not later than March 1 of the year for which an applicant seeks program admission. Applicants completing prerequisite coursework at the time of application may be considered for admission but, if selected (provisional admit), will be required to submit documentation (transcript or original grade report) of successful completion of the course(s) prior to the first day of class. Applicants selected for admission for a given year are notified by the Program Director by April 1 of that year. Admission to the program is competitive based on enrollment capacity and admission standards. Requirements for BSCLS students include:

- Submission of a completed application for admission (only completed applications are considered)
- Satisfaction of all applicable university and college admission requirements
- Satisfaction of all applicable degree requirements excluding CLS coursework
- Completion of all prerequisite coursework with a minimum of a "C" in each course
- A cumulative GPA of 2.80 (scale 4.00) with a science (biology, chemistry, physics, math) GPA of 3.00
- Demonstrated comprehension and commitment to CLS professionalism

Consideration for admission of non-degree seeking (Post Baccalaureate Certificate) applicants is limited to those who meet the following minimum requirements:

- Possess a baccalaureate degree from an accredited college or university.
- Completed 24-quarter hours (or equivalent semester hours) of biology coursework that must include a microbiology course with laboratory, immunology, human anatomy and physiology, genetics, and molecular biology.
- Completed 24-quarter hours (or equivalent semester hours) of chemistry including biochemistry and organic chemistry.
- Completed 8-quarter hours (or equivalent semester hours) of college-level math including one course in statistics.
- Completed 4-quarter hours (or equivalent semester hours) of computer science (no web-design).
- Cumulative GPA of 2.80 (4.00 scale) with a science (biology, chemistry, physics and math) GPA of 3.00.
- Submitted a completed application for admission (only completed applications are considered).
- Satisfaction of applicable university and college requirements for admission as a non-degree seeking student.
- Demonstrated comprehension and commitment to CLS professionalism.

Application packets are available from the WCOCLS Program Office, Meyer Hall 167 or on-line at <http://www2.onu.edu/~c-calvo>.

## Notice of Program Accreditation Status

In August 2002, Ohio Northern University's West Central Ohio Clinical Laboratory Science Program applied for accreditation by the National Accrediting Agency for Clinical Laboratory Science (NAACLS). The University anticipates completing the accreditation process sometime in 2004.

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## Subject - Biological Sciences (BIOL)

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### 103 - LIFE AND EARTH SCIENCE FOR EARLY & MIDDLE CHILDHOOD MAJORS

#### 4.00 Credits

Consideration of the life sciences, including the following topics: cell biology, genetics, animal anatomy and physiology (primarily human), plant anatomy and physiology, evolution and ecology. Aspects of earth science as they affect and have affected life on earth including: weather, climate, glaciers, extraterrestrial impacts and continental drift. The roles of energy, material and information are emphasized. Some science teaching methods are included. For early childhood and middle childhood majors only.

Prerequisite: CHEM 102. THIS COURSE DOES NOT SATISFY ANY REQUIREMENTS FOR THE MAJOR IN BIOLOGY, MOLECULAR BIOLOGY OR CLINICAL LABORATORY SCIENCE.

### 121 - GENERAL BIOLOGY

#### 4.00 Credits

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

### 122 - INTRODUCTION TO ZOOLOGY

#### 4.00 Credits

The classification of major animal groups, and structure of animals from a comparative systems viewpoint. Prerequisite BIOL 121.

### 123 - GENERAL BOTANY

#### 4.00 Credits

Microbes, fungi and plants emphasizing classifications and evolutionary relationships. The life histories, anatomy and physiology of photosynthetic protist, fungi and plants. Prerequisite: BIOL 121.

### 124 - INTRODUCTION TO HUMAN ANATOMY AND HISTOLOGY

#### 4.00 Credits

The gross anatomy and histology of the human body system. Laboratory includes skeletal material, histology, radiographs, and cat dissection. Corequisite: BIOL 126. Prerequisite: BIOL 122. THIS COURSE DOES NOT SATISFY ANY REQUIREMENTS FOR THE MAJOR IN BIOLOGY, MOLECULAR BIOLOGY AND CLINICAL LABORATORY SCIENCE.

### 195 - ORIENTATION (1+0)

#### 1.00 Credit

Presentations and discussions relating to adjustment and requirements of academic life within the University, College and the Department of Biological Sciences. Graded S/U.

## **196 - ALLIED MEDICAL SCIENCES ORIENTATION**

### *1.00 Credit*

Orientation for students intending to pursue pre-professional programs including physical therapy, occupational therapy, physicians assistant, chiropractic, etc. Course will involve professionals from surrounding medical centers and graduate programs. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY MAJOR OFFERED AT THE UNIVERSITY. Graded S/U.

## **201 - ENVIRONMENT AND MAN**

### *4.00 Credits*

The interaction of man and his surroundings with an emphasis on the problems arising from increasing human population, pollution, and resource use. (Formerly BIOL 125).

## **204 - SYSTEMATIC PLANT SURVEY (2+4)**

### *4.00 Credits*

Plant and algal relationships concentrating on phylogeny and classification. The morphology, development and life cycles of selected taxa will be examined. Prerequisite: BIOL 123.

## **210 - INTRODUCTORY GENETICS**

### *4.00 Credits*

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

## **213 - NATURAL HISTORY (1+6)**

### *4.00 Credits*

The recognition, identification, and understanding of local biotic communities and their inhabitants. Field study is emphasized. Prerequisite: BIOL 122 or permission of the instructor. BIOL 123 is recommended.

## **217 - INTRODUCTION TO MOLECULAR BIOLOGY (3+3)**

### *4.00 Credits*

The basic molecular processes of DNA, RNA, and protein synthesis. The regulation mechanisms used by viruses will be analyzed. The laboratory will emphasize gel electrophoresis techniques. Previous experience in organic chemistry is recommended. Prerequisites: BIOL 121, 122 and 123.

## **223 - INVERTEBRATE ZOOLOGY (3+3)**

### *4.00 Credits*

Invertebrate relationships including morphology, physiology, life cycles and taxonomy. Prerequisite: BIOL 122.

## **231 - ANATOMY AND PHYSIOLOGY 1 (3+3)**

### *4.00 Credits*

Basic principles of human structure and function. Cell physiology, histology, skin, connective tissue, neural, muscular and endocrine physiology and anatomy. Prerequisite: BIOL 122; BIOL 124 recommended.

## **232 - ANATOMY AND PHYSIOLOGY 2 (3+3)**

### *4.00 Credits*

Continuation of 231. The blood, digestive, reproductive, cardiovascular, and respiratory systems. Prerequisite: BIOL 231.

## **238 - EMERGENCY MEDICAL TECHNICIAN TRAINING**

### *1.00 Credit*

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

## **240 - OSHA 40-HOUR SAFETY TRAINING**

### *3.00 Credits*

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

## **241 - BASIC EMERGENCY RESPONSE**

### *2.00 Credits*

The basic defensive and offensive mitigation techniques available to responders. Application of skills to mock emergency responses. Basic site safety; recognition, identification and notification procedures; use of survey instrumentation; risk assessment and mitigation of chemical hazards in emergency response scenarios. Prerequisite: BIOL 240. Graded S/U. THIS COURSE DOES NOT SATISFY ANY REQUIREMENTS FOR THE MAJOR IN BIOLOGY, MOLECULAR BIOLOGY OR CLINICAL LABORATORY SCIENCE.

## **242 - GENERAL INDUSTRY SAFETY AND HEALTH COMPLIANCE**

### *2.00 Credits*

Methods of finding, interpreting and implementing governmental regulations pertaining to employee safety. Prerequisite: PLSC 306. Graded S/U. THIS COURSE DOES NOT SATISFY ANY REQUIREMENTS FOR THE MAJOR IN BIOLOGY, MOLECULAR BIOLOGY OR CLINICAL LABORATORY SCIENCE.

## **243 - HAZARDOUS WASTE GENERATOR TRAINING**

### *2.00 Credits*

Hazardous waste management procedures and the implementation of contingency plans in dealing with hazardous materials. Prerequisite: BIOL 240. Graded S/U. THIS COURSE DOES NOT SATISFY ANY REQUIREMENTS FOR THE MAJOR IN BIOLOGY, MOLECULAR BIOLOGY OR CLINICAL LABORATORY SCIENCE.

## **245 - OSHA SAFETY TRAINING REFRESHER**

### *1.00 Credit*

This eight hour workshop is designed to comply with requirements regarding annual follow-up training for hazardous waste site workers who have previously completed BIOL 240 (OSHA Safety Training). Scheduled only in consultation with the Environmental Studies advisor in the department. Taught at the University of Findlay. May be repeated 3 times for credit. Prerequisite: BIOL 240. Does not count as a biology course. Graded S/U. THIS COURSE DOES NOT SATISFY ANY REQUIREMENTS FOR THE MAJOR IN BIOLOGY, MOLECULAR BIOLOGY OR CLINICAL LABORATORY SCIENCE.

## **246 - HAZARDOUS MATERIALS TRANSPORTATION**

### *2.00 Credits*

Basic hazardous materials transportation regulations and their applications in daily operations involving the four major transportation models (air, water, rail, highways). Hazardous materials package selection, marketing, labeling, etc. for shipment of materials. Graded S/U. THIS COURSE DOES NOT SATISFY ANY REQUIREMENTS FOR THE MAJOR IN BIOLOGY, MOLECULAR BIOLOGY OR CLINICAL LABORATORY SCIENCE.

## **251 - PRINCIPLES OF ECOLOGY**

### *4.00 Credits*

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

## **263 - BIOGEOGRAPHY**

### *5.00 Credits*

The current and historic distribution of plants and animals. Consideration of continental drift, glaciation, meteorology, climatology, ecology and evolutionary history and their effect on the distribution of living things. A weekend trip is required. Prerequisites: BIOL 122 and 123. Offered alternate years.

## **271 - INTRODUCTION TO MARINE BIOLOGY**

### *4.00 Credits*

An overview of the various marine organisms and their habitats. Particular emphasis is placed on southeastern and Gulf coastal and offshore environments. A two-week field trip to a selected marine environment is required. University defensive driving certification required. Permission of instructor required. Prerequisite: BIOL 122. BIOL 223 strongly recommended.

## **290 - SPECIAL TOPICS IN BIOLOGICAL SCIENCES**

### *1.00 to 4.00 Credits*

Grading system at the discretion of the instructor. May be repeated for credit as the topic varies.

## **295 - BIOLOGICAL LITERATURE RESEARCH**

### *1.00 Credit*

Selection of a research project for the senior thesis, planning the approach to the project and submission of a formal research proposal for Department approval. The research proposal will require reading and critical analysis of portions of classical and current journal articles. Attendance of all departmental and thesis seminars required. Professional organization membership required. Prerequisites: BIOL 121, 122, 123 or 124.

## **301 - DEVELOPMENTAL ANATOMY (2+4)**

### *4.00 Credits*

Embryonic and fetal development supplemented by laboratory studies of chick and pig embryonic development. Prerequisite: BIOL 122 or equivalent.

## **302 - HUMAN ANATOMY (2+4)**

### *4.00 Credits*

The gross anatomy of the human body and body systems. Laboratories include x-rays, MRI's, skeletal material, and cadaver dissection. Prerequisite: BIOL 122 or its equivalent.

## **303 - HISTOLOGY (3+3)**

### *4.00 Credits*

Microscopic analysis of cells, tissues, and the organ systems of the human body. Prerequisite: BIOL 122 or its equivalent. Offered alternate years.

## **305 - ENVIRONMENTAL TOXICOLOGY**

### *3.00 Credits*

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

## **308 - VASCULAR PLANT ANATOMY (3+3)**

### *4.00 Credits*

General vascular plant anatomy, morphology and cellular ultrastructure. Structures from all major plant organs will be examined in an evolutionary, ecological, and physiological context. Prerequisite: BIOL 123. Offered alternate years.

## **310 - PLANT PHYSIOLOGY (3+3)**

### *4.00 Credits*

Various plant functions, including water relations, photosynthesis, metabolism and hormonal regulation of growth, development and stimulus response with emphasis on cellular structure/function relationships. Prerequisite: BIOL 123. Offered alternate years.

## **311 - MICROBIOLOGY**

### *4.00 Credits*

Classical microorganisms with the emphasis of the course on the various groups of bacteria and viruses. Fungi, algae and protozoa will receive only brief mention. Significance of the taxa will be discussed in reference to medical, environmental and basic

research importance. Laboratory techniques for culturing, identifying and manipulating microbes will be practiced. Prerequisites: BIOL 121, 122 and 123.

### **312 - MICROBIOLOGY LABORATORY**

#### *1.00 Credit*

The practice of microbiological techniques for culturing, identifying and manipulating microbes. Experimental design and data analysis will be emphasized. Corequisite: BIOL 313. Prerequisites: BIOL 121, 122, 123 or 124.

### **313 - INTRODUCTION TO MEDICAL MICROBIOLOGY**

#### *4.00 Credits*

The fundamentals of microbiological principles using medically important organisms. Topics include but not limited to: microbial cell biology, microbial genetics, interactions of microorganisms with humans and other organisms, microbial diversity and microbial evolution. Credit cannot be received for both BIOL 311 and 313. Prerequisites: BIOL 121,122,123, or 124 or one year of chemistry.

### **315 - MEDICAL TERMINOLOGY**

#### *2.00 Credits*

An overview of root words, prefixes, suffixes and their appropriate combination to develop and utilize a medical vocabulary. Pronunciation and spelling will be emphasized as well as an examination of related medical disorders, procedures, and diagnostic/ laboratory techniques. Prerequisites: BIOL 122; and sophomore standing or permission of instructor.

### **321 - INTRODUCTION TO IMMUNOLOGY**

#### *4.00 Credits*

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

### **322 - BIOSCIENCE LABORATORY 1**

#### *1.00 Credit*

The student will be introduced to methodologies used in drug development including routine histological techniques and principles/methods of in vitro and in vivo drug screening. In addition, basic mechanisms and in vivo models of selected diseases are presented. Prerequisites: BIOL 124 and 126.

### **323 - BIOSCIENCE LABORATORY 2**

#### *1.00 Credit*

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

### **331 - PHYSIOLOGY 1 (3+0)**

#### *3.00 Credits*

An advanced structural and functional approach to understanding the human body. Emphasis is on the integration of parameters from all levels of tissue and organ system function. Prerequisites: BIOL 122 and one year of chemistry.

### **332 - PHYSIOLOGY 2 (3+0)**

#### *3.00 Credits*

Continuation of 331. Prerequisite: BIOL 331.

### **333 - PHYSIOLOGY 3 (3+0)**

#### *3.00 Credits*

Continuation of 332. Prerequisite: BIOL 332.

### **334 - PHYSIOLOGY LAB 1 (0+3)**

#### *1.00 Credit*

Hands-on experiments investigating neural and skeletal muscle physiology. Corequisite: BIOL 331.

### **335 - PHYSIOLOGY LAB 2 (0+3)**

#### *1.00 Credit*

Hands-on experiments investigating cardiovascular and respiratory physiology. Corequisite: BIOL 332.

### **336 - PHYSIOLOGY LAB 3 (0+3)**

#### *1.00 Credit*

Hands-on experiments investigating renal, gastrointestinal and reproductive physiology. Corequisite: BIOL 333.

### **340 - PROFESSIONAL EXPERIENCE CO-OP**

#### *1.00 Credit*

Professional experience in a biologically or environmentally-related occupation with a governmental, consulting or industrial entity. Opportunities to interact with professional scientists in an employer-employee context. The "normal" academic program of students choosing the CO-OP option will be five years rather than the four-year degree. CO-OP students will spend a total of four ten-week terms of compensated employee/intern activity with the CO-OP agency. These CO-OP activities will be interspersed with regular academic terms on campus enrolled as a full-time student. Junior status and approval of the department chair is required for participation in the CO-OP option. Graded S/U.

### **343 - HISTOLOGICAL TECHNIQUES**

#### *3.00 Credits*

Principles and procedures used in the preparation of biological specimens for microscopic study. Offered alternate years. Prerequisite: BIOL 124 or 303, or permission of the instructor.

### **351 - CELL BIOLOGY (3+3)**

#### *4.00 Credits*

The function, structure and growth of cells will be analyzed with an emphasis on experimental techniques. Cellular organelles studied include: endomembrane systems, ribosomes, mitochondria and cytoskeletal elements. Prerequisites: BIOL 121, 122, 123 and CHEM 173.

### **360 - NORTH AMERICAN MAMMALS**

#### *4.00 Credits*

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

### **361 - ENTOMOLOGY**

#### *4.00 Credits*

The principles of entomology including the morphology, ecology, evolution and taxonomy of insects. A collection of a minimum 100 insects identified to family is required. Prerequisite: BIOL 122. BIOL 223 strongly recommended.

### **362 - PARASITOLOGY**

#### *4.00 Credits*

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

### **363 - ORNITHOLOGY**

#### *4.00 Credits*

The natural history, behavior, ecology and systematics of birds. Representatives of most orders and many families are considered. Aspects which demonstrate general biological principles are emphasized. A weekend field trip is required. Prerequisite: BIOL 122.

### **364 - HERPETOLOGY**

#### *3.00 Credits*

The biology of amphibians and reptiles with particular emphasis on the major taxonomic groupings. Morphology, behavior, systematics and the significance to man are examined. Field exercises at a major natural history museum and zoological park are required. Offered alternate years. Permission of the instructor.

### **366 - RADIATION BIOLOGY**

#### *4.00 Credits*

Interaction of radioactive decay particles with matter, the principles of radiological health and safety, and the biological effects of radiation. Offered alternate years.

### **368 - ICHTHYOLOGY**

#### *4.00 Credits*

Fish biology with particular emphasis on the freshwater teleosts inhabiting Ohio waters. Considerable emphasis placed on field exercises, techniques and systematics. University defensive driving certification required. A Nature Center use fee is charged. Prerequisite: BIOL 122.

### **371 - ADVANCED MARINE BIOLOGY**

#### *4.00 Credits*

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

### **372 - TOPICS IN MARINE BIOLOGY**

#### *4.00 Credits*

Selected areas of marine biology may be selected for in-depth study. Specific study areas include marine ichthyofauna, marine plankton, marine arthropods, marine molluscs, marine phyecology, marine mammology, marine physiology and others. A field experience will be required. Prerequisites: BIOL 371 and permission of the instructor. May be repeated once for credit.

### **383 - ANIMAL BEHAVIOR (ETHOLOGY) (3+2)**

#### *4.00 Credits*

Basic principles of the behavior and ethology of invertebrates and vertebrates, stressing observational and descriptive techniques. Offered alternate years. A Nature Center use fee is charged. Prerequisite: BIOL 121, 122 and 223.

### **395 - BIOLOGICAL RESEARCH REPORT**

#### *1.00 Credit*

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

### **397 - SELF-DIRECTED STUDIES IN THE BIOLOGICAL SCIENCES**

#### *1.00 to 2.00 Credits*

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

### **423 - TOPICS IN ECOLOGY AND BIOGEOGRAPHY**

#### *3.00 Credits*

Current literature on selected topics in Ecology and Biogeography. Prerequisites: BIOL 251, 263 or permission of instructor. Offered alternate years. May be repeated for credit.

### **451 - ADVANCED TOPICS IN CELL BIOLOGY**

#### *3.00 Credits*

Current literature on selected topics in cell biology. Prerequisite: BIOL 351 or PHBS 342. May be repeated for credit as the topic varies.

#### **481 - INTERNSHIP PROGRAM**

##### *16.00 Credits*

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

#### **482 - INTERNSHIP IN ENVIRONMENTAL STUDIES**

##### *16.00 Credits*

Required experience in areas of environmental studies such as monitoring, compliance, and consulting. Prerequisite: Senior standing.

#### **490 - SPECIAL TOPICS IN BIOLOGICAL SCIENCES**

##### *1.00 to 4.00 Credits*

Disciplines such as mammalogy and plant taxonomy. May be repeated for credit as topic varies.

#### **494 - BIOLOGY SENIOR SEMINAR**

##### *1.00 Credit*

The presentation of a library research topic in both written and oral formats. Additionally a biology comprehensive examination must be passed with a grade of 70% or better. Previous or concurrent enrollment in AASG 300. Attendance at all departmental and thesis seminars required. Prerequisite: junior or senior status.

#### **495 - SENIOR THESIS SEMINAR**

##### *1.00 Credit*

Written and oral presentation of the senior research project. The completed research project will be written in a format acceptable for submission to a scientific journal and presented during a formal seminar. Attendance at all departmental and thesis seminars required. Prerequisite: BIOL 395.

#### **497 - INDEPENDENT STUDY IN BIOLOGY**

##### *1.00 to 3.00 Credits*

Graded S/U.

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### **Subject - Clinical Laboratory Science (CLS)**

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#### **460 - FOUNDATIONS OF CLINICAL LABORATORY SCIENCE**

##### *3.00 Credits*

An integrated lecture/lab introducing the principles and practices underlying the work performed by clinical laboratory science professionals. Topics covered include safety, regulatory issues, specimen collection and phlebotomy, quality assurance, professionalism and ethics. Prerequisite: Admission to WCOCLS. Lab fee: \$25.00. (Formerly MDTC 460)

#### **461 - PROFESSIONAL PRACTICE AND DEVELOPMENT**

##### *3.00 Credits*

The concepts and practices governing clinical laboratory operations including ongoing professional development. Topics include interpersonal and interdisciplinary communication, team-building skills, organizational structure, leadership, resources management, and education techniques. Prerequisite: Admission to WCOCLS. (Formerly MDTC 475)

#### **462 - BIOLOGICAL FLUIDS**

##### *3.00 Credits*

The formation and function of various human body fluids and the methods used to analyze them in the clinical laboratory are studied. Students perform physical, biochemical and microscopic analyses and correlate results with states of health and disease. Prerequisite: BIOL 331. Lab fee: \$25.00. (Formerly MDTC 473 and 474)

#### **463 - CLINICAL IMMUNOLOGY**

##### *3.00 Credits*

Methods used in the clinical investigation of the human immune system featuring those useful in the diagnosis, treatment, or determination of infections, allergies, autoimmunity conditions, malignancy, paternity and blood product and tissue transplant compatibility. Prerequisite: BIOL 321. Lab fee: \$25.00. (Formerly MDTC 467 and 468)

#### **464 - HEMATOLOGY AND HEMOSTASIS**

##### *4.00 Credits*

The human blood, its origins, kinetics, and pathophysiology. Lecture and lab integrate theory with application of techniques used to diagnose and monitor hematological disease and disorders of hemostasis. Prerequisite: BIOL 121. Lab fee: \$25.00. (Formerly MDTC 469 and 470)

#### **465 - BLOOD BANKING AND TRANSFUSION SCIENCE**

##### *4.00 Credits*

Theoretical concepts underlying blood group biochemistry, genetics and serology are presented as they relate to blood donation and transfusion therapy practices. Students duplicate routine blood bank practices including donor selection and component preparation, detection, and identification of antibodies, and compatibility testing. Prerequisites: BIOL 210 and 321. Lab fee: \$25.00. (Formerly MDTC 465 and 466)

#### **466 - CLINICAL CHEMISTRY**

##### *4.00 Credits*

Concepts underlying biochemistry are applied to the diagnosis, prognosis and treatment of human disease. Through experimentation, students employ various techniques to detect and quantify carbohydrates, lipids, electrolytes, nitrogen metabolites, trace elements, drugs, and other medically important chemicals present in clinical specimens. Prerequisite: PHBS 341. Lab fee: \$25.00. (Formerly MDTC 471 and 472)

#### **467 - CLINICAL MICROBIOLOGY**

##### *5.00 Credits*

The etiologic role of microbes in human disease is investigated. Students demonstrate knowledge and skill using conventional techniques to isolate, identify, quantify, and differentiate pathogens including bacteria, viruses and fungi found in clinical specimens. Prerequisite: BIOL 311. Lab fee: \$25.00. (Formerly MDTC 461 and 464)

#### **468 - CLINICAL LABORATORY PRACTICUM ORIENTATION**

##### *2.00 Credits*

Advanced practical experience emphasizing the policies and procedures governing clinical laboratory operations including safety, specimen collection and phlebotomy, resource management, communications and information systems. Lab fee: \$25.00. Prerequisite: Admission to WCOCLS.

#### **469 - CLINICAL HEMATOLOGY PRACTICUM**

##### *6.00 Credits*

Advanced practical experience in the clinical hematology laboratory emphasizes application of knowledge to perform analytical procedures in a clinical setting and further develop discipline-specific competency. Prerequisite: CLS 464, admission to WCOCLS. Lab fee: \$25.00

#### **470 - BLOOD BANK PRACTICUM**

##### *6.00 Credits*

Advanced practical experience in the blood bank emphasizes application of knowledge to perform analytical procedures, implement therapy protocols in a clinical setting and further develop discipline-specific competency. Lab fee: \$25.00. Prerequisite: CLS 465 and admission to WCOCLS.

#### **471 - CLINICAL CHEMISTRY PRACTICUM**

##### *6.00 Credits*

Advanced practical experience in the clinical chemistry laboratory emphasizes application of knowledge to perform analytical procedures in a clinical setting and further develop discipline-specific competency. Prerequisite: CLS 466 and admission to WCOCLS. Lab fee: \$25.00.

#### **472 - CLINICAL MICROBIOLOGY PRACTICUM**

##### *6.00 Credits*

Advanced practical experience in the clinical microbiology laboratory emphasizes application of knowledge to perform procedures used to isolate, identify, quantify, and differentiate microbial and parasitological pathogens and to further develop discipline-specific competency. Prerequisite: CLS 467 and admission to WCOCLS. Lab fee: \$25.00.

#### **473 - IMMUNOLOGY AND INFECTIOUS DISEASES PRACTICUM**

##### *3.00 Credits*

Advanced practical experience in the clinical immunology laboratory emphasizes application of knowledge to perform those procedures used to identify and quantify human immune response to various substances and causative agents of infectious diseases, and to further develop discipline-specific competency. Prerequisite: CLS 463 and admission to WCOCLS. Lab fee: \$25.00.

#### **474 - CASE STUDIES IN CLINICAL LABORATORY SCIENCE**

##### *1.00 Credit*

Students demonstrate knowledge and comprehension of clinical laboratory science subject matter by developing and presenting a topic in case study format. Participants are encouraged to ask and respond to questions posed and issues identified as needing resolution. Prerequisite: Admission to WCOCLS program.

#### **490 - SPECIAL TOPICS IN CLINICAL LABORATORY SCIENCES**

##### *1.00 to 4.00 Credits*

Under faculty direction, further exploration of various aspects of clinical laboratory science including clinical research, computer applications, and advances in technology. Can be repeated as the topic varies. Prerequisites: Admission to WCOCLS Program and senior standing. (Formerly MDTC 490)

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### **Subject - Geology (GEOL)**

#### **280 - GEOLOGY**

##### *4.00 Credits*

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

#### **290 - SPECIAL TOPICS IN GEOLOGY**

##### *1.00 to 4.00 Credits*

May be repeated for credit up to a total of 8 hours as the topic varies.

#### **297 - INDEPENDENT STUDY IN GEOLOGY**

##### *1.00 to 3.00 Credits*

Independent study in geology. Prerequisite: GEOL 280 or permission of instructor. Graded S/U.



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## DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

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Professors Canagaratna, Hawbecker, Kurtz (*Chair*), Lamb, Peterson, Sadurski; Associate Professors Bates, Broekemeier, Gray; Assistant Professors B. Myers, Slobodzin; Visiting Assistant Professors V. Mativo, Ohrenberg; Director of Laboratories Daws

### Mission Statement

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

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

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

### The Chemistry Major

#### American Chemical Society Approved Program

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

The following core chemistry courses are required for the chemistry major: Chemistry 000, 181-182-183, 261-262-263, 271, 300, 304, 324, 341-342-343, 351 and 494. A "professional" component comprised of CHEM 311, 451, 462, and 5 credits or more from among 473, 474, 481, 2, 3, or approved 300 level or above mathematics and physics courses must be added to this core. The following cognates are required: mathematics 163-164-165; a department approved computer science course; and Physics 231-232-233 with related laboratories.

**The Basic Program** Premedical students and students seeking a less technical path into graduate and professional schools or chemical industry may select the basic program with a B.S. or B.A. degree. This program includes the core and cog-

nate courses listed above, but does not require the "professional" chemistry component.

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

### The American Chemical Society Approved Biochemistry Major

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

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

**Minor in Chemistry** Students wishing to obtain a minor in chemistry should complete these courses: Chemistry 181-182-183 (or 171-172-

173) and 261-262-263 plus two additional courses from among Chemistry 304, 312, 321, 337, 341, 342, 343, 351, or 363.

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

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## **Subject - Chemistry (CHEM)** —————

### **000 - ORIENTATION (1+0)**

#### *1.00 Credit*

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

### **100 - CHEMISTRY (3+1)**

#### *4.00 Credits*

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

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

#### *4.00 Credits*

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

### **108 - BASICS OF CHEMISTRY (4+0)**

#### *4.00 Credits*

Basic skills and concepts needed to understand the nature of chemical processes. Recommended for students with little or no previous background in chemistry prior to entry into CHEM 171. CHEM 108 DOES NOT SATISFY A GENERAL EDUCATION REQUIREMENT AND IT CANNOT BE USED TO SATISFY SPECIFIC DEPARTMENTAL OR PROGRAM REQUIREMENTS.

### **114 - CHEMISTRY OF LIFE (4+0)**

#### *4.00 Credits*

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

### **115 - ENVIRONMENTAL CHEMISTRY (4+0)**

#### *4.00 Credits*

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

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

#### *4.00 Credits*

Chemistry for engineering students. Basic chemical theories applied to practical situations.

Prerequisites: High school chemistry; MATH 164; PHYS 231, 232, 233, 234, 235, 236 or equivalent of the above or approval of the department chairman.

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

#### *4.00 Credits*

Continuation of CHEM162. Laboratory reinforces the lecture program. Prerequisite: CHEM 162.

### **171 - INTRODUCTORY CHEMISTRY 1 (4+3)**

#### *5.00 Credits*

Macroscopic concepts of the elements, compounds and reactions. Stoichiometry, thermochemistry and properties of ideal gases as applied to reactive systems. Emphasis on acid-base, redox, and descriptive chemistry. Laboratory relates physical observations to principles presented in lecture. Credit may be received for either CHEM 100 or 171 but not for both. Prerequisite: High school chemistry or equivalent, or CHEM 108.

### **172 - INTRODUCTORY CHEMISTRY 2 (4+3)**

#### *5.00 Credits*

Atomic theory and its application to bonding, molecular structure, condensed phases, chemical reactions and mechanisms. Laboratory supports principles presented in lecture, including spectroscopy. Prerequisite: CHEM 171.

### **173 - INTRODUCTORY CHEMISTRY 3 (4+3)**

#### *5.00 Credits*

Physical principles controlling chemical reactions including kinetics, thermodynamics, electrochemistry, and acid-base equilibrium conditions. Laboratory supports principles presented in lecture, including kinetics and equilibrium. Prerequisite: CHEM 172.

### **181 - INTRODUCTORY CHEMISTRY FOR MAJORS 1 (4+3)**

#### *5.00 Credits*

Same lecture and laboratory as CHEM 171.

### **182 - INTRODUCTORY CHEMISTRY FOR MAJORS 2 (4+3)**

#### *5.00 Credits*

Same lecture and laboratory as CHEM 172. Prerequisite: CHEM 181.

### **183 - INTRODUCTORY CHEMISTRY FOR MAJORS 3 (4+3)**

#### *5.00 Credits*

Same lecture and laboratory as CHEM 173. Prerequisite: CHEM 182.

## **251 - ORGANIC CHEMISTRY 1**

### *4.00 Credits*

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

## **252 - ORGANIC CHEMISTRY 2**

### *4.00 Credits*

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

## **253 - ORGANIC CHEMISTRY 3**

### *4.00 Credits*

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

## **254 - LAB FOR ORGANIC CHEMISTRY 1**

### *.00 Credits*

Physical characterization and separation techniques including chromatography applied to organic compounds. Elimination and substitution processes are investigated. Corequisite or prerequisite: CHEM 251 or 261.

## **255 - LAB FOR ORGANIC CHEMISTRY 2**

### *.00 Credits*

Applications of spectroscopy, synthetic and stereochemical applications of carbonyl and alkene addition, terpene identification, and aromatic substitution mechanisms. Prerequisite: CHEM 254 or CHEM 251 or 261. Corequisite CHEM 252.

## **256 - LAB FOR ORGANIC CHEMISTRY 3**

### *.00 Credits*

Representative short organic syntheses with bioorganic and pharmaceutical relevance. Elementary applications of enolate chemistry. Prerequisite: CHEM 255 or CHEM 262. Corequisite: CHEM 253.

## **261 - ORGANIC CHEMISTRY 1 - MAJORS**

### *4.00 Credits*

Same as Chemistry 251 lecture with Chemistry 254 Lab. Credit may be received for CHEM 251 or CHEM 261 but not for both. Prerequisite: CHEM 173 or CHEM 183.

## **262 - ORGANIC CHEMISTRY 2 - MAJORS**

### *4.00 Credits*

Same as Chemistry 252 lecture with Chemistry 255 lab. Credit may be received for CHEM 252 or CHEM 262 but not for both. Prerequisites: CHEM 251 or CHEM 261.

## **263 - ORGANIC CHEMISTRY 3 - MAJORS**

### *5.00 Credits*

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

## **271 - CHEMICAL APPLICATIONS OF MATHEMATICS**

### *4.00 Credits*

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

## **290 - SPECIAL TOPICS IN CHEMISTRY**

### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

## **297 - INDEPENDENT STUDY IN CHEMISTRY**

### *1.00 to 4.00 Credits*

Can be repeated for a maximum of 6 credit hours. Prerequisite: Approval of the department chairman.

## **300 - INTRODUCTION TO CHEMICAL RESEARCH (1+0)**

### *.00 Credits*

Methods and objectives of chemical research. Undergraduate research opportunities in the Chemistry department. Required of all students in the Basic, ACS or Biochemistry programs prior to enrollment in CHEM 497 or 481, 482 and 483. Course graded S/U. Prerequisite: Junior standing or approval of department chairman.

## **304 - ORGANIC SYNTHESIS (2+6)**

### *4.00 Credits*

Major carbon skeletal alteration techniques and selective functional group transformations. Laboratory consists of planning and executing multistep syntheses of graded complexity. Use of synthetic chemical literature introduced. Prerequisite: CHEM 253 or 263.

### **311 - CHEMISTRY OF BIOLOGICAL MOLECULES (4+0)**

#### *4.00 Credits*

Structures and properties of the major classes of biological molecules with emphasis on the physical properties of macromolecules. Includes thermodynamics, enzyme kinetics and mechanisms, coenzymes, isolation and characterization techniques and an introduction to the design and regulation of metabolic pathways. Prerequisites: CHEM 253 or 263.

### **312 - CHEMISTRY OF METABOLISM (4+0)**

#### *4.00 Credits*

Intermediary metabolism with emphasis on the chemical reactions of glycolysis, the citric acid cycle, lipid and amino acid synthesis and degradation, and nucleic acid metabolism. Prerequisite: CHEM 311.

### **321 - INTERMEDIATE INORGANIC CHEMISTRY-BIOCHEMISTRY MAJORS (3+3)**

#### *4.00 Credits*

Same lecture as CHEM 324 with a different laboratory. Bonding, structures, preparation, properties, compounds, and reactions of main group and transition metal elements. Laboratory involves basic methods of synthesis and characterization with selected experiments for the biochemistry major. Prerequisite: CHEM 263 or approval of the department chairman.

### **324 - INTERMEDIATE INORGANIC CHEMISTRY-CHEMISTRY MAJORS (3+3)**

#### *4.00 Credits*

Same lecture as CHEM 321 with a different laboratory. Bonding, structures, preparation, properties, compounds, and reactions of main group and transition metal elements. Laboratory involves basic methods of synthesis and characterization. Prerequisite: CHEM 263 or approval of the department chairman.

### **337 - ELEMENTS OF PHYSICAL CHEMISTRY (4+0)**

#### *4.00 Credits*

Principles and applications of selected areas of physical chemistry including thermodynamics, kinetics, and spectroscopy. Intended for students in the modified chemistry major or chemistry minor who wish to enhance their chemistry background. Credit may be received for CHEM 337 or CHEM 341 but not for both. Prerequisites: CHEM 163 or 173. Offered alternate years.

### **339 - CHEMICAL INTERACTIONS IN ENVIRONMENTAL SYSTEMS (4+0)**

#### *4.00 Credits*

Chemical interactions in the natural environment, including the effects of man's activities on the dynamics, thermodynamics and kinetics of atmospheric, hydrospheric and lithospheric chemical systems. Taught in alternate years. Prerequisites: CHEM 163, 253 or 263.

### **341 - PHYSICAL CHEMISTRY 1 (3+3)**

#### *4.00 Credits*

Classical thermodynamics. Laboratory illustrates principles and applications. Knowledge of computer programming

recommended. Prerequisites: CHEM 271; MATH 165; and PHYS 231, 232, and 233 with related laboratories.

### **342 - PHYSICAL CHEMISTRY 2 (3+3)**

#### *4.00 Credits*

Quantum mechanics. Laboratory illustrates applications in spectroscopy. Knowledge of elementary differential equations recommended. Prerequisite: CHEM 341.

### **343 - PHYSICAL CHEMISTRY 3 (3+3)**

#### *4.00 Credits*

Statistical thermodynamics, kinetic molecular theory and chemical kinetics. Laboratory illustrates principles and applications. Prerequisite: CHEM 342.

### **351 - INTERMEDIATE QUANTITATIVE ANALYSIS (2+6)**

#### *4.00 Credits*

Practice and principles of modern chemical methods of analysis. Introduction to instrumental methods of analysis. Prerequisite: CHEM 173 or 183.

### **363 - APPLICATIONS OF CHEMICAL INSTRUMENTATION (1+5)**

#### *3.00 Credits*

Principles and methods of instrumental measurements for the analysis of real samples. Lecture and laboratory integrated to deal with the collection, preparation and analysis of environmental, geological, biological and industrial samples. Automatic sequencing and process analysis. Prerequisite: CHEM 163 or 253 or 263. Offered alternate years.

### **390 - SPECIAL TOPICS IN CHEMISTRY**

#### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **411 - ADVANCED TOPICS IN BIOCHEMISTRY (3+0)**

#### *3.00 Credits*

Behavior and characterization of biological macromolecules. Biochemical basis for hormone action, gene expression and photosynthesis. Prerequisites: CHEM 312 or PHBS 342 and CHEM 343 or approval of the department chair.

### **414 - BIOCHEMISTRY LABORATORY 1 (0+6)**

#### *2.00 Credits*

Chemical and physical properties of biological molecules and an introduction to enzyme kinetics. Prerequisite: CHEM 312 or PHBS 342.

### **415 - BIOCHEMISTRY LABORATORY 2 (0+6)**

#### *2.00 Credits*

Protein, nucleic acid, lipid and carbohydrate isolation and characterization. Prerequisite: CHEM 414.

### **416 - BIOCHEMISTRY LABORATORY 3 (0+6)**

#### *2.00 Credits*

Modern methods of nucleic acid analysis with an emphasis on recombinant DNA techniques. Prerequisite: CHEM 415.

### **451 - ADVANCED INORGANIC CHEMISTRY (3+3)**

#### *4.00 Credits*

Theory, bonding, spectroscopy, reaction mechanisms and organometallic compounds. Laboratory involves advanced methods of synthesis and characterization. Prerequisites: CHEM 321 or 324 and 343 or approval of the department chairman.

### **462 - ADVANCED ANALYTICAL CHEMISTRY (3+3)**

#### *4.00 Credits*

Theoretical and experimental study of modern methods of instrumental analysis. Principles, design and use of chemical instrumentation. Laboratory stresses independent, investigative experimentation. Prerequisites: CHEM 343 and 351 or approval of the department chair.

### **473 - ADVANCED TOPICS IN PHYSICAL CHEMISTRY (4+0)**

#### *4.00 Credits*

Selected topics from group theory, advanced quantum mechanics, spectroscopy and chemical dynamics. Knowledge of computer programming recommended. Prerequisite: CHEM 343.

### **474 - THEORETICAL ORGANIC CHEMISTRY (4+0)**

#### *4.00 Credits*

Application of molecular orbital theory and various thermodynamic relationships to the study of organic reaction mechanisms. Structure-reactivity relationships are emphasized. Prerequisites: CHEM 304 and 343 or approval of the department chair.

### **481 - SENIOR RESEARCH 1**

#### *2.00 Credits*

Prerequisites: CHEM 300 and approval of the department chairman.

### **482 - SENIOR RESEARCH 2**

#### *2.00 Credits*

Prerequisites: CHEM 481 and approval of the department chairman.

### **483 - SENIOR RESEARCH 3**

#### *2.00 Credits*

Prerequisites: CHEM 482 and approval of the department chairman.

### **490 - SPECIAL TOPICS IN CHEMISTRY**

#### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **494 - SEMINAR IN CHEMISTRY (1+0)**

#### *1.00 Credit*

Oral presentation and a formal paper on a chemical topic related to a selected seminar theme. Required of all senior chemistry and biochemistry majors.

### **497 - INDEPENDENT STUDY IN CHEMISTRY**

#### *1.00 to 4.00 Credits*

Can be repeated for a maximum of 6 credit hours. Prerequisite: CHEM 300 and approval of the department chair.

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## **DEPARTMENT OF COMMUNICATION ARTS**

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Professors Riess (*Chair*), Roberts; Associate Professors Bayliss, Gainey, Iseman, Vivian; Assistant Professors Bell (Resident Artist), Dobson; Visiting Instructor Asman

### **Mission Statement**

The Communication Arts major emphasizes a liberal arts education combined with a professional program, designed to produce graduates who are prepared for a lifetime of learning in a diverse and changing world. We strive to provide a flexible program that adapts easily to individual needs and interests while maintaining professional standards. Our curriculum and manner of instruction encourage critical thinking, development of aesthetic and ethical standards, and an understanding of human communication in all aspects of personal and professional life. With a strong foundation in general knowledge and specialty studies, graduates are prepared for entry level positions or graduate studies in their professional areas. They also attain the reasoning, organization, and management skills necessary for a useful and meaningful life.

### **Departmental Curriculum**

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

Concentrations leading to the **Bachelor of Arts** degree are offered in the following areas:

- Professional and Organizational Communication
- Theatre
- Public Relations
- Broadcasting and Electronic Media

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

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

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

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

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

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

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

It is a policy of the Department of Communication Arts that a student not be able to earn a BA in Theatre while concurrently earning a BFA in Musical Theatre.

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

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

**Minors** are offered in the following areas:

- Professional and Organizational Communication
- Theatre
- Public Relations
- Broadcasting and Electronic Media
- Dance

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

**Business Option** A business option is available for any student majoring in communication arts. The courses for the option are in addition to concentration course work. The option is designed to provide a business focus for students within their communication career goals. See page 53 of this catalog for the Business Option courses.

### Departmental Activities

Beyond the traditional classroom experience, students are encouraged to become involved in a variety of departmental activities. WONB-FM, the campus radio station, allows students to gain experience in broadcasting and management. ONU Cable TV provides students

experience in campus telecommunication activities. The Public Relations Student Society of America gives students professional learning experiences through networking, workshops, campaign exposure, and service. Ohio Northern University Theatre offers opportunities for students to act in and engage in technical work for musicals, new works, readers theatre, dance and traditional plays. In all these activities, the department encourages student involvement. Credit toward graduation may be received from participation in some activities.

**Grading** Any grade below "C" that is received in a departmental course or a concentration requirement will not count toward major or minor requirements.

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

#### I. Concentration Requirements: (54 hours)

COMM 211	Public Speaking
COMM 212	Business and Prof. Speaking
COMM 221	Interviewing
COMM 225	Interpersonal Communication
COMM 230	Communication Theory
COMM 311	Persuasive Speaking
COMM 321	Group Communication
COMM 345	Organizational Communication
COMM 440	Comm. and Conflict Mgmt.
COMM 445	Issues in Professional Comm.
ABUS 201	PC Applications
MGMT 333	Management and Org. Beh.
MRKT 351	Principles of Marketing
COMM 236	Public Relations Writing <i>or</i>
COMM 256	Writing for Broadcasting and Electronic Media <i>or</i>
	News Writing <i>or</i>
ENGL 241	Magazine Writing <i>or</i>
ENGL 243	Persuasive Writing <i>or</i>
ENGL 343	Advanced Writing
ENGL 347	Senior Capstone Experience

#### II. Concentration Electives (12 hrs)

Choose two courses:

COMM 121	Argumentation
COMM 130	Intro. to Public Relations
COMM 150	Intro. to Broadcasting and Electronic Media
COMM 240	Parliamentary Procedure
COMM 340	Voice and Diction
COMM 348	Health Communication
COMM 421	Political Communication

Choose one course:

ABUS 312	Business Law 1
MGMT 363	Human Resource Mgmt.
MRKT 452	Consumer Behavior

### Professional and Organizational Communication Minor (32 hours)

#### I. Minor Requirements (24 hours)

COMM 211	Public Speaking*
COMM 212	Business and Prof. Speaking
COMM 225	Interpersonal Communication*

COMM 230 Communication Theory  
 COMM 311 Persuasive Speaking  
 COMM 345 Organizational Communication  
 COMM 445 Issues in Prof. Communication  
 \*Whichever was not taken to meet general education requirement

*II. Minor Electives (8 hours)*

*Choose two courses:*

COMM 121 Argumentation  
 COMM 221 Interviewing  
 COMM 240 Parliamentary Procedure  
 COMM 321 Group Communication  
 COMM 348 Health Communication  
 COMM 440 Comm. and Conflict Mgmt.

**Communication Arts with Theatre Concentration (76 hours)**

*I. Concentration Requirements: (56 hours)*

COMM 106 Introduction to Theatre  
 COMM 241 Oral Interpretation of Literature  
 COMM 260 Acting  
 COMM 275 Theatre Technology  
 COMM 283 Stage Management Practicum  
 COMM 285 Stage Management  
 COMM 291 World Theatre History  
 COMM 300 Theatre Symposium  
 COMM 340 Voice and Diction  
 COMM 370 Dance History  
 COMM 375 Topics in Theatre Design  
 COMM 380 Arts Administration  
 or 486 Playwriting  
 COMM 385 Production Analysis  
 COMM 386 Directing  
 COMM 391 American Theatre History  
 COMM 499 Independent Study (Sr. Capstone)

*II. Concentration Electives*—Choose 8 hours from the following courses:

COMM 261 Performance Practicum  
 COMM 276 Production Practicum  
 COMM 277 Shop Practicum  
 COMM 283 Stage Management Practicum  
 COMM 378 Design Practicum  
 COMM 387 Directing Practicum

*III. Concentration Cognates: (12 hours)*

ENGL 208 Modern World Drama  
 ENGL 260 Introduction to Shakespeare  
 or 412 Shakespeare Studies  
 PHIL 341 Aesthetics

**Theatre Minor (28 hours)**

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

**Communication Arts with Public Relations Concentration (62 hrs.)**

*I. Concentration Requirements (38 hrs.)*

COMM 130 Introduction to Public Relations  
 COMM 203 Public Relations Practicum\*  
 COMM 236 Public Relations Writing  
 TECH 240 Introduction to Communication Technology  
 COMM 330 Publicity, Media & Campaigns  
 COMM 335 Internship\*\*  
 COMM 336 Advanced Public Relations Writing  
 COMM 342 Public Relations Research  
 COMM 430 Public Relations Case Studies Senior Capstone Experience

*II. Concentration Electives (24 hours)*

*Choose four courses:*

COMM 211 Public Speaking\*\*\*  
 or  
 COMM 225 Interpersonal Communication\*\*\*  
 ART 222 Graphic Design  
 ENGL 241 News Writing  
 ENGL 243 Magazine Writing  
 COMM 256 Writing for Broadcasting and Electronic Media  
 COMM 321 Group Communication  
 COMM 355 Broadcast Journalism Special Topics in Public Relations\*\*\*\*

*Choose two courses:*

COMM 150 Intro. to Broadcasting and Electronic Media  
 COMM 212 Business and Prof. Speaking  
 COMM 221 Interviewing  
 MGMT 333 Management and Org. Beh.  
 MRKT 351 Principles of Marketing  
 MGMT 363 Human Resource Management  
 MGMT 410 Business and Society

\*Six hours minimum-twelve hours maximum

\*\*Four hours minimum-sixteen hour maximum; Minimum 2.5 GPA required overall and in concentration requirements

\*\*\*Whichever was not taken to meet general education requirements

\*\*\*\*May be repeated with different topics

**Public Relations Minor (28 hours)**

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

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

*I. Concentration Requirements (29 hours)*

COMM 150 Intro. to Broadcasting and Electronic Media

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

## *II. Concentration Electives (20 hours)*

*Choose three courses:*

COMM 355	Broadcast Journalism
COMM 452	Broadcast Sales and Promo.
COMM 454	Corporate Audio and Video Production
COMM 455	Broadcasting and Electronic Media Management
ENGL 371	Journalism

*Choose two courses:*

COMM 130	Introduction to Public Relations
COMM 211	Public Speaking*
or	
COMM 225	Interpersonal Communication*
COMM 212	Business and Professional Speaking
COMM 221	Interviewing
COMM 260	Acting
COMM 340	Voice and Diction
MGMT 333	Management and Org. Beh.
MRKT 351	Principles of Marketing

\*Whichever was not taken to meet general education requirement

## **Broadcasting and Electronic Media Minor (28 hrs)**

COMM 150	Intro. to Broadcasting and Electronic Media
COMM 256	Writing for Broadcasting and Electronic Media
COMM 258	B and EM Practicum: Audio (2 hrs.)
COMM 259	B and EM Practicum: Video (2 hrs.)
COMM 355	Broadcast Journalism
COMM 452	Broadcast Sales and Promotions
COMM 453	Mass Media & Society
COMM 455	Broadcasting and Electronic Media Management

## **Communication Arts with Musical Theatre Concentration (87 hours)**

### *I. Concentration Requirements*

Theatre (50 hours)

COMM 106	Introduction to Theatre
COMM 260	Acting
COMM 261	Performance Practicum
or 204	Dance Practicum
COMM 265	Musical Theatre Performance
COMM 275	Theatre Technology
COMM 278	Makeup
COMM 291	World Theatre History
COMM 300	Theatre Symposium

COMM 360	Topics in Acting
COMM 370	Dance History
or 470	Dance Composition
COMM 460	Styles of Acting
COMM 465	Adv. Musical Th. Performance
COMM 499	Independent Study: Sr. Capstone

Music (21 hours)

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

Dance (14 hours)

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

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

## *II. Concentration Cognitive Requirements (2 hours)*

AHPE 050	Social Dance
AHPE 083	Square and Folk Dance

## **Communication Arts/Dance Minor (29 hrs.)**

The dance minor, which is available to majors and non-majors throughout the university, has a strong technical component. Students pursuing a dance minor must choose a technical area of emphasis in either ballet or modern dance.

### *Ballet Emphasis*

COMM 117	Ballet 1
COMM 118	Modern Dance 1
COMM 204	Dance Practicum
COMM 217	Ballet 2
COMM 370	Dance History*
COMM 470	Dance Composition*

### *Modern Dance Emphasis*

COMM 117	Ballet 1
COMM 118	Modern Dance 1
COMM 204	Dance Practicum
COMM 218	Modern Dance 2
COMM 370	Dance History*
COMM 470	Dance Composition*

\*To be offered on alternate years.



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## **Subject - Communication Arts (COMM)**

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### **000 - ORIENTATION**

#### *1.00 Credit*

Familiarization with the departmental requirements for majors, planning a program of courses, university catalog and library. Required of departmental majors. Graded S/U.

### **105 - THEATRE APPRECIATION**

#### *4.00 Credits*

An introduction to theatre through the study of its origin and development, and its contemporary theory and practice. For the non-major. Two hours of lecture per week, along with play attendance and production experience. Not applicable to the Musical Theatre or Theatre concentration. May not be taken after a successful enrollment in COMM 106. (Discipline: Theatre)

### **106 - INTRODUCTION TO THEATRE**

#### *4.00 Credits*

Introduction to dramatic structures and genres, production styles, and the roles of artists within the theatre. Overview of the history of theatre's place in society through the examination of selected dramatic texts. Enrollment limited to students in the theatre and musical theatre concentrations. (Discipline: Theatre)

### **110 - PUBLICATION ACTIVITIES PRACTICUM**

#### *1.00 Credit*

Participation in design, photography, writing, and producing the Ohio Northern yearbook. May be repeated, but only 12 hours will count toward graduation. Graded S/U.

### **114 - INTRODUCTION TO DANCE**

#### *2.00 Credits*

The three forms of dance; ballet, jazz and tap for development of the student's ability to learn basic components and vocabulary of each of these forms. For the student with little or no previous experience. May be repeated, but only 8 credit hours will count toward graduation. (Discipline: Theatre)

### **115 - TAP DANCE 1**

#### *2.00 Credits*

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

### **116 - JAZZ DANCE 1**

#### *2.00 Credits*

Jazz dancing taught in a studio format. The course is designed for the student with little or no experience in jazz dancing. May be repeated, but only 8 credit hours will count toward graduation. (Discipline: Theatre)

### **117 - BALLET 1**

#### *2.00 Credits*

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

### **118 - MODERN DANCE 1**

#### *2.00 Credits*

Modern dance taught in the studio format. The course is designed for the student with little or no experience in modern dance. May be repeated, but only 8 credit hours will count toward graduation. (Discipline: Theatre)

### **121 - ARGUMENTATION**

#### *4.00 Credits*

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

### **130 - INTRODUCTION TO PUBLIC RELATIONS**

#### *4.00 Credits*

The role, function, and responsibilities of the public relations practitioner within organizations. (Discipline: Public Relations)

### **150 - INTRODUCTION TO BROADCASTING AND ELECTRONIC MEDIA**

#### *4.00 Credits*

A survey course that examines various aspects of broadcasting, cable, and the emerging electronic media. (Discipline: Brdcasting. & Elec. Media)

### **190 - SPECIAL TOPICS IN COMMUNICATION ARTS**

#### *1.00 to 4.00 Credits*

Course may be repeated as topics vary, but only 12 hours will count toward graduation.

### **203 - PUBLIC RELATIONS PRACTICUM**

#### *1.00 to 4.00 Credits*

Course provides students the opportunity to experience public relations firsthand through professional involvement with service and non-profit projects. A repeatable course. For non-majors, only 12 hours apply toward graduation. Prerequisite: Permission of instructor. (Discipline: Public Relations)

### **204 - DANCE PRACTICUM**

#### *1.00 to 4.00 Credits*

Participation in a collaborative laboratory experience. Open only to students who have auditioned and been awarded roles in Ohio Northern University Dance Company or dance productions. A repeatable course. For non-majors, only 12 hours apply toward graduation. Prerequisite: Permission of the instructor. (Discipline: Theatre)

### **211 - PUBLIC SPEAKING**

#### *4.00 Credits*

Basic principles of preparation, organization, and delivery of original informative and persuasive speeches. (Discipline: Prof. & Org. Comm.)

### **212 - BUSINESS AND PROFESSIONAL SPEAKING**

#### *4.00 Credits*

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

### **215 - TAP DANCE 2**

#### *2.00 Credits*

A studio tap dance class for the intermediate and advanced student. Course may be repeated, but only 8 credit hours will count toward graduation. (Discipline: Theatre)

**216 - JAZZ DANCE 2***2.00 Credits*

A studio jazz dance class for the intermediate and advanced student. Course may be repeated, but only 8 credit hours will count toward graduation. (Discipline: Theatre)

**217 - BALLET 2***2.00 Credits*

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

**218 - MODERN DANCE 2***2.00 Credits*

A modern dance studio class for the intermediate and advanced student. Course may be repeated, but only 8 credit hours will count toward graduation. (Discipline: Theatre)

**221 - INTERVIEWING***4.00 Credits*

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

**225 - INTERPERSONAL COMMUNICATION***4.00 Credits*

Course explores a range of theories and issues which will help students improve their ability to communicate effectively in a variety of interpersonal relationships. (Discipline: Prof. & Org. Comm.)

**230 - COMMUNICATION THEORY***4.00 Credits*

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

**236 - PUBLIC RELATIONS WRITING***4.00 Credits*

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

**240 - PARLIAMENTARY PROCEDURE***4.00 Credits*

Methods of conducting formal meetings by parliamentary rules. (Discipline: Prof. & Org. Comm.)

**241 - ORAL INTERPRETATION OF LITERATURE***4.00 Credits*

Analyzing prose, poetry, and dramatic literature for individual and group presentations in class. Offered alternate years. (Discipline: Prof. & Org. Comm. and Theatre)

**256 - WRITING FOR THE BROADCASTING AND ELECTRONIC MEDIA***4.00 Credits*

A study of the principles and techniques of copywriting for radio and television, corporate audio/video productions and the electronic media. (Discipline: Brdcstg. & Elec. Media)

**257 - BROADCASTING AND ELECTRONIC MEDIA PRACTICUM***1.00 to 4.00 Credits*

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

**258 - BROADCASTING AND ELECTRONIC MEDIA PRACTICUM: AUDIO***1.00 to 4.00 Credits*

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

**259 - BROADCASTING AND ELECTRONIC MEDIA PRACTICUM: VIDEO***1.00 to 4.00 Credits*

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

**260 - ACTING***4.00 Credits*

A studio class designed to introduce and develop fundamental acting skills through readings, discussions, exercises, monologues, and scenes. Course may be repeated, but only 12 credit hours will count toward graduation. (Discipline: Theatre)

**261 - PERFORMANCE PRACTICUM***1.00 to 4.00 Credits*

Participation in a collaborative laboratory experience. Open only to students who have auditioned for and have been awarded roles in University mainstage or studio theatre productions. A repeatable course. For non-majors, only 12 hours apply toward graduation. Prerequisite: Permission of the instructor. (Discipline: Theatre)

**265 - MUSICAL THEATRE PERFORMANCE STUDIES***4.00 Credits*

Performance techniques for musical theatre. Students will also prepare and present scenes and songs from musicals. Course may be repeated, but only 12 credit hours will count toward graduation. (Discipline: Theatre)

**275 - THEATRE TECHNOLOGY***4.00 Credits*

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

**276 - PRODUCTION PRACTICUM**

*1.00 to 4.00 Credits*

Participation in a collaborative laboratory experience which involves serving on a crew for a University mainstage or studio production. A repeatable course. For non-majors, only 12 hours apply toward graduation. Prerequisite: Permission of the instructor. (Discipline: Theatre)

**277 - SHOP PRACTICUM**

*1.00 to 4.00 Credits*

Participation in a collaborative laboratory experience working in the scene or costume shop for University productions. A repeatable course. For non-majors, only 12 hours apply toward graduation. Prerequisite: Permission of the instructor. (Discipline: Theatre)

**278 - MAKEUP**

*2.00 Credits*

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

**283 - STAGE MANAGEMENT PRACTICUM**

*1.00 to 4.00 Credits*

Participation in a collaborative laboratory experience as a stage manager or assistant stage manager for a University mainstage or studio production. A repeatable course. For non-majors, only 12 hours apply toward graduation. Prerequisite: Permission of the instructor. (Discipline: Theatre)

**285 - STAGE MANAGEMENT**

*2.00 Credits*

Principles and practices of stage management and logistical organization of commercial and noncommercial theatre. Content includes scheduling, pre-production planning, auditions, rehearsals, performance procedures, budgeting, company organization and structure. (Discipline: Theatre)

**290 - SPECIAL TOPICS IN COMMUNICATION ARTS**

*1.00 to 4.00 Credits*

Course may be repeated as topics vary, but only 12 hours will count toward graduation.

**291 - WORLD THEATRE HISTORY**

*4.00 Credits*

A survey of the history and social impact of the theatre in Western and non-Western cultures from ancient times to the Renaissance. (Discipline: Theatre)

**299 - INDEPENDENT STUDY IN COMMUNICATION ARTS**

*1.00 to 4.00 Credits*

A topic in Communication Arts of particular interest to the Communication Arts student. Prerequisite: Permission of department.

**300 - THEATRE SYMPOSIUM**

*1.00 Credit*

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

**311 - PERSUASIVE SPEAKING**

*4.00 Credits*

An advanced public speaking course with an emphasis on persuasive theory and techniques. Prerequisite: COMM 211. (Discipline: Prof. & Org. Comm.)

**317 - BALLET POINTE**

*2.00 Credits*

The techniques of working en pointe. Pointe work will include exercises at the barre and techniques necessary for the execution of proper work en pointe. May be repeated, but only 8 credit hours will count toward graduation. (Discipline: Theatre)

**321 - GROUP COMMUNICATION**

*4.00 Credits*

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

**330 - PUBLICITY, MEDIA, AND CAMPAIGNS**

*4.00 Credits*

A course analyzing techniques for motivating target audiences along with practical analysis and preparation of communication materials to elicit reactions or support from specialized groups. Prerequisite: COMM 336. (Discipline: Public Relations)

**335 - INTERNSHIP**

*1.00 to 16.00 Credits*

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

**336 - ADVANCED PUBLIC RELATIONS WRITING**

*4.00 Credits*

This course presents opportunities for researching, identifying and writing public affairs columns, editorials, features, and position papers for use in the public relations arena. Prerequisites: COMM 342 and 236. (Discipline: Public Relations)

**340 - VOICE AND DICTION**

*4.00 Credits*

Voice and speech production; intensive drill, on a phonetic basis, in articulating the sounds which make up the English language, with attention to the production of good vocal quality and expression. (Disciplines: Prof. & Org. Comm. and Theatre)

### **342 - PUBLIC RELATIONS RESEARCH FOR PLANNING AND EVALUATION**

#### *4.00 Credits*

The planning and evaluation process of public relations. The difference between public relations research and social science research methods. Prerequisite: COMM 130. (Discipline: Public Relations)

### **345 - ORGANIZATIONAL COMMUNICATION**

#### *4.00 Credits*

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

### **348 - HEALTH COMMUNICATION**

#### *4.00 Credits*

Theory and practice of health communication. Examines communication between practitioner/client, in community/ consumer health education, in health teams and groups, in health care delivery systems, in support systems for the elderly, disabled, terminally ill, in intercultural settings. Offered alternate years. (Discipline: Prof. & Org. Comm.)

### **351 - AUDIO/VIDEO PRODUCTION**

#### *4.00 Credits*

Principles and techniques of audio and video production. Course will include lab times utilizing the facilities of WONB Radio and ONU Cable Television. Prerequisite: COMM 256. (Discipline: Brdcstg. & Elec. Media)

### **355 - BROADCAST JOURNALISM**

#### *4.00 Credits*

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

### **360 - TOPICS IN ACTING**

#### *4.00 Credits*

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

### **370 - DANCE HISTORY**

#### *4.00 Credits*

Evolution of dance through the ages. Ethnic dance styles and dance as a performance art will be studied. Some reconstruction of cultural and historical dance will be included in the coursework. Offered alternate years. (Discipline: Theatre)

### **373 - ISSUES IN PUBLIC RELATIONS**

#### *1.00 to 4.00 Credits*

Current topics in the field including but not limited to: the role of public relations in organizational decision making, ethics and special practice areas. Prerequisite: Permission of instructor. (Discipline: Public Relations)

### **375 - TOPICS IN THEATRE DESIGN**

#### *4.00 Credits*

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

### **378 - DESIGN PRACTICUM**

#### *1.00 to 4.00 Credits*

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

### **380 - ARTS ADMINISTRATION**

#### *4.00 Credits*

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

### **385 - PRODUCTION ANALYSIS**

#### *4.00 Credits*

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

### **386 - DIRECTING**

#### *4.00 Credits*

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

### **387 - DIRECTING PRACTICUM**

#### *1.00 to 4.00 Credits*

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

### **390 - SPECIAL TOPICS IN COMMUNICATION ARTS**

#### *1.00 to 4.00 Credits*

May be repeated as topics vary, but only 12 hours will count toward graduation.

### **391 - AMERICAN THEATRE HISTORY**

#### *4.00 Credits*

An historical survey of American theatre and popular entertainment forms from the colonial period through the rise of realism and contemporary theatre. (Discipline: Theatre)

## **421 - POLITICAL COMMUNICATION**

### *4.00 Credits*

Political communication and the means to assess political activities through rhetorical methods of analysis. Methods may include those presented by classical and contemporary theorists, such as Aristotle, Lloyd Bitzer, and Kenneth Burke. Offered alternate years. (Discipline: Prof. & Org. Comm.)

## **430 - PUBLIC RELATIONS CASE STUDIES**

### *4.00 Credits*

Public relations case studies concerning problems in industry, business, education, government, social welfare, and trade associations. Prerequisite: COMM 330 and senior standing. (Discipline: Public Relations)

## **440 - COMMUNICATION AND CONFLICT MANAGEMENT**

### *4.00 Credits*

The central role of communication in the creation and management of conflict, as well as communication skills and strategies for managing conflict effectively, with an emphasis on collaborative problem solving. Offered alternate years.

Prerequisite: Sophomore standing. (Discipline: Prof. & Org. Comm.)

## **445 - ISSUES IN PROFESSIONAL COMMUNICATION**

### *4.00 Credits*

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

## **452 - BROADCAST SALES AND PROMOTIONS**

### *4.00 Credits*

Skills involved in selling broadcast time and station promotion. (Discipline: Brdcstg. & Elec. Media)

## **453 - MASS MEDIA AND SOCIETY**

### *4.00 Credits*

The legal, ethical, and social responsibilities of journalists and other mass communicators. Prerequisite: COMM 150. (Discipline: Brdcstg. & Elec. Media)

## **454 - CORPORATE VIDEO PRODUCTION**

### *4.00 Credits*

Video production course reviewing the needs of the corporate, non-broadcast, industry. Will cover planning, scripting and production of short and long form corporate videos. Prerequisite: COMM 150. (Discipline: Brdcstg. & Elec. Media)

## **455 - BROADCASTING AND ELECTRONIC MEDIA MANAGEMENT**

### *4.00 Credits*

Sales, programming, marketing, and management techniques unique to the broadcast medium. Prerequisite: COMM 150. (Discipline: Brdcstg. & Elec. Media)

## **457 - BEM PRACTICUM: SENIOR CAPSTONE**

### *1.00 to 4.00 Credits*

A production/performance based course which serves as the senior capstone for the Broadcasting and Electronic Media concentration. Prerequisite: Permission of instructor and senior status. (Discipline: Brdcstg. & Elec. Media)

## **460 - STYLES OF ACTING**

### *4.00 Credits*

Improvement of acting techniques and preparation for creating characterizations from the classical theatre repertoire including Shakespearean Tragedy and Comedy, Moliere's Comedy, Restoration Comedy of Manners, and Farce. Course may be repeated but only 12 credit hours will count toward graduation. Prerequisite: COMM 260. (Discipline: Theatre)

## **465 - ADVANCED MUSICAL THEATRE PERFORMANCE**

### *4.00 Credits*

Choosing audition material and performing scenes and songs from the traditional and contemporary styles of musical theatre. Enrollment limited to students accepted into the musical theatre concentration. Prerequisite: COMM 265. (Discipline: Theatre)

## **470 - DANCE COMPOSITION**

### *4.00 Credits*

Principles general to all choreographic compositional styles and application of these principles through weekly choreographic compositional projects and in class performances. Offered alternate years. (Discipline: Theatre)

## **480 - ARTS IN THE COMMUNITY**

### *4.00 Credits*

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

## **486 - PLAYWRITING**

### *4.00 Credits*

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

## **490 - SPECIAL TOPICS IN COMMUNICATION ARTS**

### *1.00 to 4.00 Credits*

May be repeated as topics vary, but only 12 hours will count toward graduation.

## **499 - INDEPENDENT STUDY IN COMMUNICATION ARTS**

### *1.00 to 4.00 Credits*

Prerequisite: Permission of department.

# CENTER FOR TEACHER EDUCATION

Professors Crosser, Dufault, Haynes (*Director*), Hoagstrom, Meininger, C. Smith; Associate Professors Bates, Berg, Campoli, D'Arca, Freeman, Greavu, Myers, Roepke, Romanowski, Theisen; Assistant Professors M. Croskery, J. Mativo, Witte; Instructor Garver; Visiting Instructor McCullough; Lecturer Russell

## Mission Statement

**TEACHING IS ENABLING.** The enabling teacher is firmly grounded in knowledge of the learner, knowledge of discipline, and knowledge of pedagogy. Utilizing that knowledge, the enabling teacher is able to put into motion pedagogical strategies which are both appropriate and sound. The end result of that teaching and corresponding learning is greater than the sum of its parts. This synergism is exemplified by the model of four interdependent gears which, when properly meshed, result in an integrated mechanism for enabling students to become autonomous learners capable of contributing both individually and collectively to the common good of the larger society.

Ohio Northern University is vitally concerned with preparing effective teachers. Programs are offered within the degree requirements in almost every department. In addition, a Master of Education in Teaching (M.E.T.) is offered through a graduate education program. This program provides teachers the opportunity to add an Endorsement in Reading to their current certification or licensure. Students must complete 45-quarter hours of study at the graduate level.

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

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

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

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

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

## Admission to the Teacher Education Program

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

## Teacher Education At Ohio Northern University (60 students completed the program 2000-2001)

### Praxis II Results

#### Test

Principles of Teaching & Learning K-6

Principles of Teaching & Learning 7-12

Elementary Education Curriculum and Instruction

#### Results

96% of ONU students passed National pass rate using Ohio cut-off scores=70%

92% of ONU students passed National pass rate using Ohio cut-off scores=83%

96% of ONU students passed National pass rate using Ohio cut-off scores=73%

\*All of the test areas have pass rates above the national average.

## Early Childhood Education preK-3rd grade Licensure

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

## Professional Education Requirements

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

EDUC 115	Culture and Schooling, 4 hrs.
EDUC 150	Five-Day Field Experience, 0 hrs. (taken twice)
EDUC 210	Exceptional Learner, 4 hrs.
EDUC 320	Educational Technologies, 4 hrs.

- EDUC 342 Reading in the Content Area , 5 hrs.
- EDUC 445 Organization and Administration of American Schools, 2 hrs.
- EDUC 470 Student Teaching, 15 hrs.
- EDUC 475 Student Teaching Seminar, 1 hr.

**Plus:**

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

**Middle Childhood Education 4-9th grades Licensure**

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

**Professional Education Requirements**

- EDUC 115 Culture and Schooling, 4 hrs.
- EDUC 150 Five- Day Field Experience, 0 hrs. (taken twice)
- EDUC 210 Exceptional Learner, 4 hrs.
- EDUC 320 Educational Technologies, 4 hrs.
- EDUC 342 Reading in the Content Area, 5 hrs.
- EDUC 445 Organization and Administration of American Schools, 2 hrs.
- EDUC 470 Student Teaching, 15 hrs.
- EDUC 475 Student Teaching Seminar, 1 hr.

**Plus:**

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

In addition the student must choose two of four content areas to use for concentration areas; Students may choose between math, reading-language arts, science, or social studies.

They will take the education methods course for that particular middle level and at least 30 hours in the disciplines.

**Choices:**

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

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

**Adolescent Licensure 7-12**

Requirements for licensure in the various adolescent teaching fields may be obtained in the office of the Center for Teacher Education.

**Adolescent Licensure Programs are offered in the following areas:**

- Integrated Science
- Integrated Language Arts
- Integrated Mathematics
- Integrated Social Studies
- Life Science
- Physical Science

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

- EDUC 115 Culture and Schooling, 4 hrs.
- EDUC 150 Five- Day Field Experience, 0 hrs. (taken twice)
- EDUC 210 Exceptional Learner, 4 hrs.
- EDUC 224 Young and Late Adolescent Psychology, 4 hrs.
- EDUC 285 Curriculum, 4 hrs.
- EDUC 320 Educational Technologies, 4 hrs.
- EDUC 342 Reading in the Content Area, 5 hrs.
- EDUC 440 Classroom Strategies, 4 hrs.
- EDUC 445 Organization and Administration of American Schools, 2 hrs.

**Specific Methods Courses:**

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

- EDUC 451 Integrated Science Methods, 5 hrs.
- EDUC 452 Integrated English/Language Arts Methods, 4 hrs.
- EDUC 453 Integrated Social Studies Methods, 4 hrs.
- EDUC 454 Integrated Mathematics Methods, 4 hrs.
- EDUC 475 Student Teaching Seminar, 1 hr.
- EDUC 480 Student Teaching, 15 hrs.

## Multiage Licensure PreK-12

Requirements for licensure in the various multiage licensure areas may be obtained in the office of the Center for Teacher Education.

### Multiage Licensure Programs are offered in the following areas:

Art  
Health  
Physical Education  
Foreign Language  
Music

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

EDUC 115	Culture and Schooling, 4 hrs.
EDUC 150	Five-Day Field Experience, 0 hrs. (taken twice)
EDUC 210	Exceptional Learner, 4 hrs.
EDUC 223	Child Development and Psychology, 4 hrs.
EDUC 224	Young and Late Adolescent Psychology, 4 hrs.
EDUC 285	Curriculum, 4 hrs.
EDUC 320	Educational Technologies, 4 hrs.
•EDUC 342	Reading in the Content Area, 5 hrs.
•EDUC 440	Classroom Strategies, 4 hrs.
•EDUC 445	Organization and Administration of American Schools, 2 hrs.

### Specific Methods Courses:

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

EDUC 456	Integrated Modern Language Methods, 4 hrs.
EDUC 457	Integrated Art Methods, 4 hrs.
EDUC 459	Integrated Music Methods, 4 hrs.
EDUC 460	Integrated Health Methods, 4 hrs.
EDUC 461	Integrated Physical Education Methods, 4 hrs.
EDUC 470	Student Teaching, 7 hrs.
EDUC 475	Student Teaching Seminar 1 hr.
EDUC 480	Student Teaching, 8 hrs.

### Vocational Licensure 4-12

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

### Vocational Licensure Programs are offered in the following area:

Technology Education

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

EDUC 115	Culture and Schooling 4 hrs.
EDUC 150	Five- Day Field Experience, 0 hrs. (taken twice)
EDUC 210	Exceptional Learner, 4 hrs.
EDUC 224	Young and Late Adolescent Psychology, 4 hrs.
EDUC 285	Curriculum, 4 hrs.
•EDUC 342	Reading in the Content Area, 5 hrs.
•EDUC 445	Organization and Administration of American Schools, 2 hrs.

### Specific Methods Courses:

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

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

### Master of Education in Teaching Courses:

#### Core Courses

EDUC 505	Foundations of American Education, 5 hrs.
EDUC 515	Educational Ethics and Character Education, 5 hrs.
EDUC 525	Curriculum and Instructional Design, 5 hrs.
EDUC 570	Educational Research and Design, 5 hrs.

#### Reading Courses

EDUC 540	Foundations of Reading, 5 hrs.
EDUC 545	Advanced Reading in the Content Area, 5 hrs.
EDUC 550	Clinical Diagnosis and Correction of Reading Difficulties, 5 hrs.
EDUC 555	Literature and Reading, 5 hrs.

#### Electives\*

EDUC 530	Current Trends in Education, 5 hrs.
EDUC 560	Current Trends in Reading, 5 hrs.
EDUC 572	Teaching Students With Exceptional Needs, 5 hrs.
EDUC 599	Special Topics, 1-5 hrs.
EDUC 597	Independent Study, 5 hrs.



## Practicum

EDUC 590 Research Practicum, 5-10 hrs.

\*Electives can be taken if a student has already completed some of the required course work or does not wish to obtain endorsement.

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## Subject- Education (EDUC)

### 115 - CULTURE AND SCHOOLING

#### 4.00 Credits

The philosophical, historical, and sociological aspects of education used to investigate the cultural factors that impact students and curriculum including diverse world views, values, norms, and history of multicultural American groups. Characteristics, legislation, programs, and strategies for identifying and working with exceptional students in the classroom are stressed. Clinical hours are awarded and a 5-day field experience is required. Required of all Early Childhood Education, Middle Childhood Education, Adolescent Level and Multiage Level majors.

### 150 - FIVE-DAY FIELD EXPERIENCE

#### .00 Credit

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

### 190 - SPECIAL TOPICS IN EDUCATION

#### 1.00 to 4.00 Credits

Can be repeated as the topic varies.

### 195 - ORIENTATION

#### 1.00 Credit

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

### 210 - EXCEPTIONAL LEARNER

#### 4.00 Credits

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

### 220 - INTEGRATED FINE ARTS

#### 4.00 Credits

Translation of knowledge of and experiences in the visual and performing arts into appropriate integrated experiences. Styles and modes of visual and performing arts across cultures and from various periods of history.

### 223 - CHILD DEVELOPMENT AND PSYCHOLOGY

#### 4.00 Credits

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

### 224 - YOUNG AND LATE ADOLESCENT PSYCHOLOGY

#### 4.00 Credits

The physical, social, emotional, and intellectual development of early and late adolescents, and the corresponding implications for curriculum and instruction. Includes a minimum of 30 hours of field experience. Prerequisite: EDUC 115.

### 230 - EARLY CHILDHOOD MATHEMATICS

#### 4.00 Credits

Content, strategies, materials, and evaluation that reflect the current emphasis in mathematics. Includes 20 hours of field experience. Prerequisites: MATH 172 and 173.

### 240 - INTRODUCTION TO EARLY CHILDHOOD EDUCATION

#### 4.00 Credits

History, philosophy and current developments in the field of early childhood education. Includes 30 hours of field experience. Prerequisites: EDUC 115 and 223, 2.5 GPA, and completion of Praxis 1.

### 241 - EARLY CHILDHOOD METHODS AND INSTRUCTION

#### 4.00 Credits

Teaching processes and development of materials for early childhood settings. Planning methodology and strategies. Prerequisite: EDUC 240.

### 242 - EARLY CHILDHOOD CURRICULUM AND POLICIES

#### 4.00 Credits

The comprehensive examination of the curriculum of early childhood programs and the policies of the early childhood movement. Curriculum planning and organization. Includes 30 hours of field experience. Prerequisites: EDUC 240 and 241.

### 260 - INTRODUCTION TO MIDDLE CHILDHOOD EDUCATION

#### 4.00 Credits

The history, philosophy, and organization of middle school education. Evaluation of multi-media materials, creative exploration, and enrichment activities to build an effective middle school. Includes 20 hours of field experience. Prerequisites: EDUC 115 and 224, 2.5 GPA, and completion of Praxis 1.

## **261 - MIDDLE CHILDHOOD METHODS AND INSTRUCTION**

### *4.00 Credits*

Integrated teaching at the middle school level. Planning, instruction, strategies, and evaluation of an interdisciplinary nature. Includes 20 hours of field experience. Prerequisites: EDUC 115, 224, and 260.

## **262 - MIDDLE CHILDHOOD CURRICULUM AND POLICIES**

### *4.00 Credits*

The development of theory, organization, and decision making in middle school curriculum from integrated, interdisciplinary focus. Includes 20 hours of field experience. Prerequisites: EDUC 115, 224, 260 and 261.

## **285 - CURRICULUM AND INSTRUCTION**

### *4.00 Credits*

School curriculum practices, instructional materials, curriculum development changes and trends. Discussion of mainstreaming and gifted education. Designed for adolescent and multiage education majors. Includes 30 hours of clinical field experience. Prerequisites: EDUC 115, 2.5 GPA, and completion of Praxis 1.

## **290 - SPECIAL TOPICS IN EDUCATION**

### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

## **304 - STRATEGIES FOR TECHNOLOGY EDUCATION**

### *4.00 Credits*

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

## **308 - MIDDLE SCHOOL MATH METHODS**

### *4.00 Credits*

Methods and current issues in middle school mathematics teaching, including problem solving, technology, strategies, and teaching aids. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

## **309 - MIDDLE SCHOOL SCIENCE METHODS**

### *5.00 Credits*

Science in middle school education, the preparation of materials, and organization of learning activities for problem solving. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

## **310 - INTEGRATED LANGUAGE ARTS**

### *4.00 Credits*

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

## **311 - MIDDLE SCHOOL SOCIAL STUDIES METHODS**

### *4.00 Credits*

Objectives, trends, issues, and evaluation of the teaching of social studies in the middle school. Includes the preparation of units and organization of learning activities for problem solving. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

## **312 - TEACHING PHONICS**

### *5.00 Credits*

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

## **314 - FOUNDATIONS OF READING AND ASSESSMENTS**

### *5.00 Credits*

Principles and methods of teaching reading including whole language, phonics, creative writing, diagnostic skills, and preparation and evaluation of reading materials. Includes 30 hours of field experience (including 10 hours clinical). Prerequisites: Admission to the teacher education program and EDUC 312.

## **320 - INSTRUCTIONAL MEDIA AND EDUCATIONAL TECHNOLOGIES**

### *4.00 Credits*

The role that technologies play in our schools of today as well as in American society. Emphasis on instruction, planning, selection, utilization, operation, production, and evaluation of media equipment and materials including motion, media, projected visuals, audio media, computers, and multimedia systems. Includes 10 hours of clinical experience. Prerequisites: EDUC 115 and juniors or seniors seeking teacher licensure.

## **340 - DIAGNOSIS AND CORRECTION OF READING DIFFICULTIES**

### *4.00 Credits*

Reading difficulties and related causal factors. Investigation and utilization of diagnostic procedures and techniques, including experience in administration and interpretation. Appropriate teaching procedures for reading. Prerequisites: EDUC 312 and 314, and admission to the teacher education program.

### **342 - READING IN THE CONTENT AREA**

#### *5.00 Credits*

Strategies for facilitating student/text interaction in a variety of curricular areas. Emphasis on the following aspects of reading: assessment of student and text; prereading, vocabulary, and comprehension strategies; study skills. Includes 30 hours of clinical field experience.

Prerequisite: Admission to the teacher education program.

### **350 - DEPARTMENTAL FIELD EXPERIENCE**

#### *.00 Credits*

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

### **390 - SPECIAL TOPICS IN EDUCATION**

#### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **440 - CLASSROOM STRATEGIES**

#### *4.00 Credits*

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

Prerequisite: Admission to the teacher education program.

### **445 - ORGANIZATION AND ADMINISTRATION OF SCHOOLS IN AMERICAN SOCIETY**

#### *2.00 Credits*

Professional issues and orientation to school administrative structure, job search strategies, educational law, educational finance and the politics of education. Prerequisites: Admission to the teacher education program and senior status.

### **451 - INTEGRATED SCIENCE METHODS**

#### *5.00 Credits*

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

### **452 - INTEGRATED ENGLISH/LANGUAGE ARTS METHODS**

#### *4.00 Credits*

Effective methods in teaching grammar, writing, and literature. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

### **453 - INTEGRATED SOCIAL STUDIES METHODS**

#### *4.00 Credits*

Effective methods in teaching History, Political Science, Psychology, Sociology, Geography, Economics and Anthropology. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

### **454 - INTEGRATED MATHEMATICS METHODS**

#### *4.00 Credits*

Methods and current issues in high school mathematics teaching including guided discovery, problem solving, diagnosis and remediation, technology, strategies, and teaching aids. This course will not count toward a major in mathematics. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

#### **456 - INTEGRATED MODERN LANGUAGE METHODS**

##### *4.00 Credits*

Theory and practice of current methods for teaching modern languages; evaluation of textbooks; use of audio-visual media; methods of evaluating student progress. Includes 30 hours of field experience. Prerequisites: minimum of 18 hours in foreign languages; admission to the teacher education program.

#### **457 - INTEGRATED ART METHODS**

##### *4.00 Credits*

Effective strategies dealing with materials, techniques and methods of instruction in art. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

#### **458 - ORGANIZATION AND METHODS OF TECHNOLOGY EDUCATION**

##### *4.00 Credits*

Philosophical constructs, organizing courses, program and course objectives, preparing lesson plans and industrial materials, laboratory procedures, and administrative practices. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

#### **459 - INTEGRATED MUSIC METHODS**

##### *4.00 Credits*

Philosophy, techniques, materials, curriculum planning for the music teacher. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

#### **460 - INTEGRATED HEALTH METHODS**

##### *4.00 Credits*

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

#### **461 - INTEGRATED PHYSICAL EDUCATION METHODS**

##### *4.00 Credits*

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

#### **470 - STUDENT TEACHING - EARLY CHILDHOOD-MIDDLE CHILDHOOD**

##### *7.00 or 15.00 Credits*

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

#### **475 - STUDENT TEACHING SEMINAR**

##### *1.00 Credit*

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

#### **480 - STUDENT TEACHING-ADOLESCENT**

##### *8.00 or 15.00 Credits*

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

#### **490 - SPECIAL TOPICS IN EDUCATION**

##### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

#### **497 - INDEPENDENT STUDY IN EDUCATION**

##### *1.00 to 4.00 Credits*

In areas of student interest with permission of the Director of Teacher Education.

## **505 - FOUNDATIONS OF AMERICAN EDUCATION**

### *5.00 Credits*

An interdisciplinary approach which integrates history, philosophy, and sociology, ways in which these disciplines are applied to the investigation of selected educational topics, questions, and issues relevant to contemporary education. Prerequisite: Admission to the graduate program.

## **515 - EDUCATIONAL ETHICS AND CHARACTER EDUCATION**

### *5.00 Credits*

The area of educational ethics and character education centering on education and schooling as problems and positions; examinations of theoretical and practical applications, including character education. Prerequisite: Admission to the graduate program.

## **525 - CURRICULUM AND INSTRUCTIONAL DESIGN**

### *5.00 Credits*

Development of knowledge, skills, and dispositions needed to structure knowledge, organize and change the elementary, middle, and secondary school curriculum; emphasis on purposes, materials and practices associated with effective schools. Prerequisite: Admission to the graduate program.

## **530 - CURRENT TRENDS IN EDUCATION**

### *1.00 to 5.00 Credits*

Examination of contemporary issues and trends in education and their historical perspectives. Prerequisite: Admission to the graduate program.

## **540 - FOUNDATIONS OF READING**

### *5.00 Credits*

Different models of reading will be presented. The understanding of what research reveals about each of the components of the reading process. Prerequisite: Admission to the graduate program.

## **545 - ADVANCED READING IN THE CONTENT AREA**

### *5.00 Credits*

Emphasis on helping K-12 students process and learn from content materials, including understanding text structure, vocabulary development, comprehension strategies, language acquisitions, purposes of language, assessment and evaluation. Prerequisite: Admission to the graduate program.

## **550 - CLINICAL DIAGNOSIS AND CORRECTION OF READING DIFFICULTIES**

### *5.00 Credits*

Reading difficulties and related casual factors. Investigation and utilization of diagnostic procedures and techniques, including experience and interpretation. Prerequisite: Admission to the graduate program.

## **555 - LITERATURE AND READING**

### *5.00 Credits*

Development of knowledge, skills and dispositions needed to increase knowledge and awareness of how crucial children's literature is in the curriculum of schools today; emphasis on using children's literature as a tool for building character. Prerequisite: Admission to the graduate program.

## **560 - CURRENT TRENDS IN READING**

### *5.00 Credits*

Development of knowledge, skills, and dispositions needed to increase knowledge and awareness of trends, research, strategies, and innovations in reading today. Prerequisite: Admission to the graduate program.

## **570 - EDUCATIONAL RESEARCH AND DESIGN**

### *5.00 Credits*

Development of knowledge, skills, and dispositions needed to research and evaluate the effectiveness of instruction; emphasis on research strategies and analysis of descriptive information. Prerequisite: Admission to the graduate program.

## **572 - TEACHING STUDENTS WITH EXCEPTIONAL NEEDS**

### *5.00 Credits*

Designing instruction through an examination of pupil assessment, the correlation of strategies and materials, and application of classroom management techniques. Direct experiences in planning educational programs and making curricular modifications for students with exceptional needs in regular classrooms.

## **590 - RESEARCH PRACTICUM**

### *5.00 Credits*

Culminating written project for completion of Masters Degree. Can be repeated once. Permission of the Director of Graduate Program is required. Prerequisites: Admission to the graduate program, EDUC 505, 515, 525 and 570.

## **597 - INDEPENDENT STUDY**

### *1.00 to 5.00 Credits*

Studies in areas of student interest. Permission of the Director of Graduate Program is required. Can be repeated once. Prerequisites: Admission to the graduate program. EDUC 505, 515, and 525.

## **599 - SPECIAL TOPICS IN EDUCATION**

### *1.00 to 5.00 Credits*

Can be repeated as the topic varies.



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## DEPARTMENT OF ENGLISH

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Professors Banks (*Chair*), McManus, Smith;  
Associate Professors Cullen, Lietz, Scott; Assistant  
Professors Croskery, Pitts; Instructors Bender,  
O'Connell

### Mission Statement

As a traditional humanities discipline, English promotes the reading of Western and non-Western literatures as works of art, sources of pleasure, and means to understanding people and culture. As a theoretical discipline, it responds to and incorporates changing conceptions of language, texts, literature, rhetoric, and interpretation. As a practical discipline, it develops within multimedia settings the various skills essential to critical thinking and writing.

The English faculty designs its courses for the general education of the university student and for the training of its majors. English prepares students for life after college, for professional and business careers, for law school, and for graduate study in English and other disciplines.

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

The Department encourages complementary majors, minors, or options in other disciplines, including specifically a recommended option or minor in business. The student may also complete two majors or a major and a minor within the department so long as there is no more than 40% duplication of courses within the second major or minor. The Department provides opportunities for practical experience in writing, editing, and publication management through internships, five different practica, a department newsletter, and various activities within the Sigma Tau Delta honor society.

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

**General Education:** The B.A. requirement in humanities beyond ENGL 204 may be fulfilled by designated literature, culture, criticism, and creative writing courses. Students with an ACT score of 25 or above in both English and Reading may be waived from ENGL 110.

**Major and Minor Programs:** 100-level English courses and ENGL 204 do not count toward any major, minor, or option in the Department, nor does any course with a grade below "C." Required cognate for the Major in Literature is one course in History, Modern Language or Philosophy beyond General Education requirements. For Creative Writing and Language Arts Education majors, 7 courses (not including the senior essay) must be above the 200 level. For the other majors, the 300/400-level requirements are indicated separately below. Most majors and minors must take specified literature courses from the following **core distribution**:

British Literature: Medieval/Renaissance  
Jacobean  
(ENGL 213, 310, 319, 410, 412)  
British Literature: Restoration/Eighteenth-Century/  
Romantic  
(ENGL 213, 214, 322, 323)  
British Literature: Victorian/Twentieth-Century  
(ENGL 214, 324, 326)  
American Literature: Pre-Twentieth-Century  
(ENGL 211, 334)  
American Literature: Twentieth-Century  
(ENGL 212, 335)  
World Literature: Ancient to Modern  
(ENGL 208, 209, 219, 220,  
262, 430, 432, 451)

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

### Major in Literature (63 hours)

#### Required Courses (25 hours)

ENGL 210	English Studies
ENGL 351	English Language
ENGL 384	Directed Reading
ENGL 410	Chaucer
ENGL 412	Shakespeare Studies
ENGL 451	Literary Criticism
ENGL 483-85	Senior Essay

#### Electives (24 hours)

##### Option 1

ENGL 211	American Literature 1
ENGL 212	American Literature 2

Three 300/400 courses in British literature, at least two after 1700

(ENGL 310, 319, 322, 323, 324, 326, 364)

One 300/400 course in American literature  
(ENGL 334, 335, 365, 431)

##### Option 2

ENGL 213	British Literature 1
ENGL 214	British Literature 2

Three courses in American Literature, at least two 300/400 level

(ENGL 261, 334, 335, 365, 431)

One 300/400 course in British literature after 1700  
(ENGL 322, 323, 324, 326, 364)

### Additional Electives (14 hours)

Two courses in world literature, at least one 300/400 level

(ENGL 208, 209, 219, 220, 262, 430, 432)

One elective in literature, culture or writing

Two hours of publication experience

(ENGL 230, 231, 232, 244, 250, 251, 420; COMM 110)

### Cognate (4 hours)

One course in Language, History or Philosophy beyond General Education requirements

### **Major in Language Arts Education (66 hours)**

Integrated Language Arts Secondary

Teaching Licensure

#### Literature (38 hours)

ENGL	210	English Studies
ENGL	211	American Literature 1
ENGL	212	American Literature 2
ENGL	225	Children's & Young Adult Literature
ENGL	384	Directed Reading
ENGL	410	Chaucer
ENGL	412	Shakespeare Studies
ENGL	483	Reading for the Senior Essay

Three literature courses in three core areas:

British literature (Restoration to Romantic; Victorian/Twentieth Century) and world literature

#### Writing (16 hours)

ENGL	241	News Writing <i>or</i>
ENGL	243	Magazine Writing <i>or</i>
ENGL	244	Desktop Publishing <i>or</i>
ENGL	443	Nonfiction Writing
ENGL	230	Web Publishing Practicum <i>or</i>
ENGL	250	Newspaper Practicum <i>or</i>
ENGL	251	Magazine Practicum
ENGL	341	Poetry Writing <i>or</i>
ENGL	342	Fiction Writing
ENGL	343	Persuasive Writing <i>or</i>
ENGL	347	Advanced Writing
ENGL	484	Senior Essay 1
ENGL	485	Senior Essay 2

#### Linguistics, Grammar, History of the Language (4 hours)

ENGL	351	English Language
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#### Oral Communication (8 hours)

COMM	225	Interpersonal Communication
COMM	241	Oral Interpretation of Literature

Attendance at two professional conferences/workshops

### **Major in Creative Writing (56 hours)**

#### Required Writing Courses (8 hours)

ENGL	341	Poetry Writing
ENGL	342	Fiction Writing

#### Two Additional Writing Courses (8 hours)

ENGL	345	Screenwriting
ENGL	349	Writing for Young Audiences
ENGL	443	Nonfiction Writing
COMM	486	Playwriting

#### Other Required Courses (12 hours)

ENGL	251	Magazine Practicum
ENGL	384	Directed Reading
ENGL	451	Literary Criticism
ENGL	483-85	Senior Essay

### Language and Literature Core (28 hours)

ENGL 210 English Studies

ENGL 351 English Language

Five courses in five core areas in British, American, and world literature

### **Major in Professional Writing (57 hours + Secondary Study)**

#### Professional Writing Core (30 hours)

ENGL	243	Magazine Writing
ENGL	244	Desktop Publishing
ENGL	347	Advanced Writing
ENGL	384	Directed Reading
ENGL	405	Cultural Studies
ENGL	443	Nonfiction Writing
ENGL	470	Editing
ENGL	481	Internship
ENGL	483-5	Senior Essay

#### Core Elective (4 hours)

ENGL	241	News Writing
COMM	256	Writing for Broadcasting and Electronic Media
ENGL	342	Fiction Writing
ENGL	343	Persuasive Writing
ENGL	345	Screenwriting
ENGL	346	Prelaw Writing
ENGL	377	Professional Writing Workshop
ENGL	451	Literary Criticism

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

#### Practicums (3 hours in at least two different practicums)

ENGL	230	Web Publishing Practicum
ENGL	250	Newspaper Practicum
ENGL	251	Magazine Practicum

#### Language and Literature Core (20 hours)

ENGL	210	English Studies
ENGL	351	English Language

Three literature courses in three core areas, two at the 300/400 level:

World Literature (ENGL 208, 209, 219, 220, 262, 432, 451)

British Literature (ENGL 213, 214, 260, 310-326, 364, 410, 412)

American Literature (ENGL 211, 212, 261, 334, 335, 365, 431)

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

#### Secondary Study

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

### **Major in Journalism**

#### **(62 hours + Secondary Study)**

#### Journalism Core Requirements (38 hours)

ENGL	241	News Writing
ENGL	243	Magazine Writing
ENGL	244	Desktop Publishing
ENGL	250	Newspaper Practicum



ENGL	371	Journalism
ENGL	380	Literary Journalism
ENGL	384	Directed Reading (Journalism related)
ENGL	470	Editing
ENGL	481	Internship
ENGL	483-85	Senior Essay (Journalism related)

Core Elective (4 hours)

COMM	150	Introduction to Broadcasting & Electronic Media
COMM	221	Interviewing
COMM	230	Communication Theory
COMM	256	Writing for Broadcasting and Electronic Media
ENGL	343	Persuasive Writing
ENGL	346	Prelaw Writing
ENGL	347	Advanced Writing
COMM	355	Broadcast Journalism
ENGL	376	Journalism Workshop
ENGL	443	Nonfiction Writing
ENGL	452	Cultural Studies

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

Language and Literature Core (20 hours)

ENGL	210	English Studies
ENGL	351	English Language

Three literature courses in three core areas, two at the 300/400 level:

World Literature (ENGL 208, 209, 219, 220, 262, 432, 451)

British Literature (ENGL 213, 214, 260, 310-326, 364, 410, 412)

American Literature (ENGL 211, 212, 261, 334, 335, 365, 431)

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

Secondary Study

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

**Minor in Literature (32 hours)**

The Minor in Literature requires the completion of eight 4-hour courses, including electives according to the following distribution: 2 American, 2 British, 1 World, 2 open. At least one American literature course must be before 1900, and at least one British literature course before 1800. At least four of the courses must be on the 300/400 level.

Required course (4 hours)

English 210	English Studies
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Electives (28 hours)

British Literature:	ENGL 213, 214, 310, 319, 322, 323, 324, 326, 364, 410, 412
American Literature:	ENGL 211, 212, 261, 334, 335, 365, 431
World Literature:	ENGL 208, 209, 219, 220, 262, 430, 432
Literary Studies:	ENGL 451
Creative Writing:	ENGL 341, 342, 345, 349, 443, COMM 486

**Minor in Creative Writing (30 hours)**

Required course (4 hours)

ENGL 210	English Studies
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Writing and Criticism Electives (14 hours)

ENGL	251	Magazine Practicum (1-2 hours)
ENGL	341	Poetry Writing
ENGL	342	Fiction Writing
ENGL	345	Screenwriting
ENGL	349	Writing for Young Audiences
ENGL	375	Creative Writing Workshop (1-4 hours)
ENGL	443	Nonfiction Writing
ENGL	451	Literary Criticism
COMM	486	Playwriting

Literature Electives (12 hours)

Three courses from at least two of the three core areas of British, American, and world literatures

**Minor in Professional Writing (30 hours)**

Required courses (26 hours)

ENGL	210	English Studies
ENGL	230	Web Publishing Practicum
ENGL	243	Magazine Writing
ENGL	244	Desktop Publishing
ENGL	251	Magazine Practicum
ENGL	347	Advanced Writing
ENGL	443	Nonfiction Writing
ENGL	470	Editing

Elective (4 hours)

ENGL	241	News Writing
COMM	256	Writing for Broadcasting and Electronic Media
ENGL	342	Fiction Writing
ENGL	343	Persuasive Writing
ENGL	345	Screenwriting
ENGL	346	Prelaw Writing
ENGL	349	Writing for Young Audiences
ENGL	377	Professional Writing Workshop
ENGL	405	Cultural Studies
ENGL	451	Literary Criticism

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

**Minor in Journalism (30 hours)**

Required courses (18 hours)

ENGL	241	News Writing
ENGL	243	Magazine Writing

ENGL	250	Newspaper Practicum
ENGL	371	Journalism
ENGL	470	Editing
<u>Elective (12 hours)</u>		
COMM	150	Introduction to Broadcasting and Electronic Media
COMM	221	Interviewing
ART	222	Graphic Design 1
COMM	230	Communication Theory
COMM	236	Public Relations Writing
COMM	256	Writing for Broadcasting and Electronic Media
ENGL	343	Persuasive Writing
ENGL	346	Prelaw Writing
ENGL	347	Advanced Writing
COMM	355	Broadcast Journalism
ENGL	376	Journalism Workshop
ENGL	380	Literary Journalism
ENGL	443	Nonfiction Writing

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

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## **Subject - English (ENGL)**

### **000 - ENGLISH ORIENTATION**

*1.00 Credit*

Familiarization with department faculty, students, programs, and technology. Emphasis on career development within a liberal arts framework.

Introduction to general university services and activities. Required of all majors. Graded S/U.

### **001 - ENRICHMENT**

*.00 Credits*

Enrichment of the curriculum for English majors through required attendance at designated cultural and academic extracurricular events.

Must be taken twice each academic year by all English majors. Graded S/U.

### **105 - WRITING WORKSHOP**

*4.00 Credits*

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

### **110 - WRITING 1**

*4.00 Credits*

Development of reading and writing skills for effective communication on the college level. Prerequisite for all 200-level courses in English. Students with ACT of 25 or above in both English and Reading may be exempted from this course.

### **111 - WRITING 2**

*4.00 Credits*

Continuation of ENGL110. Prerequisite: ENGL 110 or HONR 100 or an ACT of 25 or above in English and Reading.

### **151 - COLLEGE COMPOSITION 1**

*4.00 Credits*

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

### **152 - COLLEGE COMPOSITION 2**

*4.00 Credits*

Continuation of ENGL151. ENGL151and 152 together may be substituted for ENGL 110. Prerequisite: ENGL 151 or 110.

### **153 - COLLEGE COMPOSITION 3**

*4.00 Credits*

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

### **190 - SPECIAL TOPICS IN ENGLISH**

*1.00 to 4.00 Credits*

May be repeated as the topic varies.

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Except for ENGL 210, 211-12, 213-14, 225 and 244, 200-level courses are designed for the general student. ENGL 210 is open only to majors and minors. Prerequisites for ENGL 204: ENGL 110, 111, and Sophomore standing. No prerequisites for Practica: 230, 231, 232, 250, 251. Prerequisite for other 200-level courses: English 110 or English and Reading ACT of 25 or above.

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### **204 - GREAT WORKS**

*4.00 Credits*

Major literary texts from the classical period to the present, including Shakespeare. A general education course. An Arts and Sciences requirement. Not open to Freshmen. Does not count toward an English major or minor. Prerequisites: ENGL 111 or 153.

### **207 - MODERN POETRY**

*4.00 Credits*

Representative twentieth-century poetry written in English. Prerequisite: ENGL110 or equivalent.

### **208 - MODERN WORLD DRAMA**

*4.00 Credits*

Representative twentieth-century plays from Western and non-Western countries. ENGL 110 or equivalent

### **209 - MODERN FICTION**

*4.00 Credits*

Representative twentieth-century novels, short stories, and other prose fiction from Western and non-Western countries. Prerequisite: ENGL110 or equivalent.

## **210 - ENGLISH STUDIES**

### *4.00 Credits*

An introduction to the English major. An overview of literary terms, genres, historical periods, literary theory, and rhetoric; practice in literary criticism and creative writing; an awareness of career opportunities. Required of all majors and of minors in Creative Writing, Literature, and Professional Writing. Open only to English majors and minors. To be taken during the sophomore year. Prerequisite: ENGL 111.

## **211 - AMERICAN LITERATURE 1**

### *4.00 Credits*

The early period of American Literature (1492-1870s), including such genres as exploration and spiritual narratives, revolutionary political writing, fiction, and poetry, taking into account social and historical context. Prerequisite: ENGL 111.

## **212 - AMERICAN LITERATURE 2**

### *4.00 Credits*

The early modern, modern, and contemporary periods of American literature (1870s to the present), including such movements as regionalism, realism, naturalism, modernism, and postmodernism in a variety of genres—mainly poetry, fiction, and drama—in a rapidly changing social milieu. Prerequisite: ENGL 111.

## **213 - BRITISH LITERATURE 1**

### *4.00 Credits*

A survey of British literature from the Anglo-Saxon period through Neo-classicism in the eighteenth century, focusing on major and minor authors as reflective of both continuity and radical change in literary forms and cultural contexts. (Formerly ENGL 201 and 202) Prerequisite: ENGL 111.

## **214 - BRITISH LITERATURE 2**

### *4.00 Credits*

A survey of British literature from late eighteenth-century Romanticism to the end of the twentieth century, with continuing emphasis on literary themes and forms within changing cultural contexts. (Formerly ENGL 202 and 203) Prerequisite: ENGL 111.

## **219 - NON-WESTERN LITERATURE**

### *4.00 Credits*

Representative literary works in English or in English translation from the non-Western world. This course satisfies the Arts and Sciences non-Western requirement. Prerequisite: ENGL 110 or equivalent.

## **220 - EUROPEAN LITERATURE**

### *4.00 Credits*

The Western tradition in literature, including representative continental literature in translation from the Classical Greek era to the present. Prerequisite: ENGL 110 or equivalent.

## **225 - CHILDREN'S AND YOUNG ADULT LITERATURE**

### *4.00 Credits*

Literature specifically suited for children and adolescents. The readings selected from various genres will be studied using the same critical approaches that are traditionally used to analyze literature for adults. Open to majors in Language Arts Education, Youth Ministry, Early Childhood and Middle Childhood Education. Others by department permission only. Prerequisite: ENGL 111.

## **230 - WEB PUBLISHING PRACTICUM**

### *1.00 to 6.00 Credits*

Publication activities on the ONU electronic magazine (e-zine). One to six credits, depending on role, to be determined by department. Course may be repeated, but only 12 hours will count toward graduation. Graded S/U.

## **231 - JOURNAL PUBLISHING PRACTICUM**

### *1.00 to 6.00 Credits*

Workshop experience for English majors in technical and management skills related to the publication of professional journals. One to six credits, depending on role, to be determined by department. May be repeated, but only 12 hours will count toward graduation.

## **232 - RESEARCH PRACTICUM**

### *1.00 to 6.00 Credits*

Practical experience in using such research skills as documentation, editing, and preparing manuscripts. Student will work with faculty member as research assistant. One to six credits, depending on role, to be determined by department. May be repeated, but only 12 hours will count toward graduation. English majors only. Graded S/U.

## **241 - NEWS WRITING**

### *4.00 Credits*

Gathering information and writing for a newspaper. Prerequisite: ENGL 111.

## **243 - MAGAZINE WRITING**

### *4.00 Credits*

The discipline and technique of writing feature articles for magazines. Prerequisite: ENGL 111.

## **244 - DESKTOP PUBLISHING**

### *4.00 Credits*

Design principles of desktop publishing used in the printing industry. Practical application of software publication tools in a computer classroom setting. Issues specific to English Department programs. Open to English Department majors. Others by permission of the department.

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## **250 - NEWSPAPER PRACTICUM**

*1.00 to 6.00 Credits*

Journalism activities on the Northern Review. One to six credits, depending on role, to be determined by department. Course may be repeated, but only 12 hours will count toward graduation. Graded S/U. (Formerly Journalism Activities-Newspaper)

## **251 - MAGAZINE PRACTICUM**

*1.00 to 6.00 Credits*

Publication activities on Polaris. One to six credits, depending on role, to be determined by department. Course may be repeated, but only 12 hours will count toward graduation. Graded S/U. (Formerly Journalism Activities-Magazine)

## **260 - INTRODUCTION TO SHAKESPEARE**

*4.00 Credits*

Representative plays and poetry from the entire span of Shakespeare's career and from each of the genres. For Communication Arts and Education majors. Others by department permission only. Prerequisites: ENGL 110 or equivalent.

## **261 - AFRICAN-AMERICAN LITERATURE**

*4.00 Credits*

The tradition of African-American literature from the eighteenth-century to the present, including such genres as spiritual and folk poems, autobiography, poetry, short stories, novels and essays, in the context of formative political, historical, and social forces, with a special emphasis on writing as an expression of liberation for the African-American community. Prerequisite: ENGL 110 or equivalent.

## **262 - AFRICAN LITERATURE**

*4.00 Credits*

Folktales, traditional epics, and contemporary fiction and drama that reflect African life and thought from the pre-colonial era to present day. This course satisfies the Arts and Sciences non-Western requirement. (Formerly ENGL 370) Prerequisite: ENGL 110 or equivalent.

## **263 - WOMEN'S LITERATURE**

*4.00 Credits*

Selected works by or about women in English or in translation, drawn from a variety of genres in all historical eras, viewed from various critical perspectives, including feminist and historical/cultural theories. Prerequisite: ENGL 110 or equivalent.

## **290 - SPECIAL TOPICS IN ENGLISH**

*1.00 to 4.00 Credits*

May be repeated as the topic varies. Prerequisite: ENGL 110 or equivalent.

## **297 - INDEPENDENT STUDY IN ENGLISH**

*1.00 to 4.00 Credits*

May be repeated as the topic varies. Prerequisite: ENGL 110 or equivalent.

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300-level courses are designed for English majors and minors but some are open to the general student.

Prerequisite for 300-level creative writing and English language courses (ENGL 341, 342, 345, 349, 351): ENGL 204. Prerequisites for other 300-level writing courses (343, 346, 347): ENGL 204 and 210. Prerequisites for 300-level journalism courses (371, 380): ENGL 204 and 241. Prerequisites for 300-level literature courses: ENGL 204 and 210; one other 200-level literature course recommended.

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## **310 - BRITISH LITERATURE BEFORE 1500**

*4.00 Credits*

The epic, lyric and narrative poetry, tales, myths, and romances, and forms of drama during the early periods of British literature. Prerequisite: ENGL 204 and 210.

## **319 - RENAISSANCE AND JACOBEAN LITERATURE**

*4.00 Credits*

Major writers, themes, movements, or genres from 1485 to 1660, including such figures as Marlowe, Jonson, Spenser, Donne, and Milton. Prerequisites: ENGL 204 and 210.

## **322 - RESTORATION AND THE EIGHTEENTH CENTURY**

*4.00 Credits*

Major works of English literature between 1660 and 1789, with concentration on a few writers such as Dryden, Behn, Congreve, Addison & Steele, Richardson, Swift, Pope, and Sheridan. Prerequisites: ENGL 204 and 210.

## **323 - BRITISH ROMANTICISM**

*4.00 Credits*

Revolutionary changes in British literature between 1790 and 1832, including such innovative thinkers and writers as Blake, the Wordsworths, Coleridge, Byron, Keats, the Shelleys, Wollstonecraft, Radcliffe and Scott. Prerequisites ENGL 210 and ENGL 204 or HONR 200 or 205 or 212.

## **324 - VICTORIAN PERIOD**

*4.00 Credits*

British literature between 1832 and 1901, with concentration on a few selected writers. Prerequisite: ENGL 204 and 210.

## **326 - TWENTIETH-CENTURY BRITISH LITERATURE**

*4.00 Credits*

British literature from 1900 to the present, with concentration on a few selected writers. Prerequisite: ENGL 210 and ENGL 204 or HONR 200 or 205 or 212.

### **334 - AMERICAN WRITERS 1**

#### *4.00 Credits*

American literature from 1492 to the 1870s, with concentration on a few selected writers or themes in the context of literary and social influences. Prerequisite: ENGL 204 and 210.

### **335 - AMERICAN WRITERS 2**

#### *4.00 Credits*

American literature from the 1870s to the present, with concentration on a few selected writers or themes in the context of literary and social influences. Prerequisite: ENGL 210 and ENGL 204 or HONR 200 or 205 or 212.

### **341 - POETRY WRITING**

#### *4.00 Credits*

The discipline and technique of writing poetry. May be continued as ENGL 498-Independent Study in Writing. Prerequisite: ENGL 204 or HONR 200 or 205 or 212.

### **342 - FICTION WRITING**

#### *4.00 Credits*

The discipline and technique of writing fiction. May be continued as ENGL 498-Independent Study in Writing. Prerequisite: ENGL 204.

### **343 - PERSUASIVE WRITING**

#### *4.00 Credits*

Analysis of and practice in using traditional rhetorical strategies of persuasion. Prerequisites: ENGL 204 and 210.

### **345 - SCREENWRITING**

#### *4.00 Credits*

Introduction to the theory and practice of screenwriting, and to the promotion of completed screenplays. Offered alternate years. May be continued as ENGL 498-Independent Study in Writing. Prerequisite: ENGL 204.

### **346 - PRELAW WRITING**

#### *4.00 Credits*

Analysis of fact situations and the writing of quasi-legal essays, memoranda, and briefs. Emphasis on close reading, logical thinking, and clear written expression in standard English. Prerequisites: ENGL 210 and ENGL 204 or HONR 200 or 205 or 212.

### **347 - ADVANCED WRITING**

#### *4.00 Credits*

An understanding of and practice in writing various academic genres, from research and analysis to book reviews and abstracts. Prerequisites: ENGL 204 and 210.

### **349 - WRITING FOR YOUNG AUDIENCES**

#### *4.00 Credits*

The theory and practice of writing for young audiences. May be continued as ENGL 498-Independent Study in Writing. Prerequisite: ENGL 204 or HONR 200 or 205 or 212.

### **351 - THE ENGLISH LANGUAGE**

#### *4.00 Credits*

History of the English language, developments in American and world English, and changes in vocabulary, grammar, phonology, and dialects.

### **364 - THE BRITISH NOVEL**

#### *4.00 Credits*

Representative novels, from the early development of the genre in the eighteenth century to romantic and social novels of the nineteenth and experimental novels of the twentieth centuries. Prerequisites: ENGL 204 and 210.

### **365 - THE AMERICAN NOVEL**

#### *4.00 Credits*

Selected novels from the eighteenth century to the present in the context of diverse literary and social influences. Prerequisite: ENGL 210 and ENGL 204 or HONR 200 or 205 or 212.

### **371 - JOURNALISM**

#### *4.00 Credits*

American journalism history and principles; contemporary ethical, legal, and diversity issues; the press as a cultural force in society. Prerequisites: ENGL 204 and 241.

### **372 - REPORTING CONTEMPORARY ISSUES**

#### *4.00 Credits*

Advanced journalism reporting techniques and research tools and formats used by newspapers in covering public policy issues. Prerequisites: ENGL 204 and 241.

### **375 - CREATIVE WRITING WORKSHOP**

#### *1.00 to 4.00 Credits*

Individualized instruction in writing poetry and fiction within a workshop environment. Prerequisites: ENGL 204 and one of the following, ENGL 341, 342, 345, 349, 443, COMM 486

### **376 - JOURNALISM WORKSHOP**

#### *1.00 to 4.00 Credits*

Individualized instruction in writing for the print media within a workshop environment. Prerequisites: ENGL 204 and 241.

### **377 - PROFESSIONAL WRITING WORKSHOP**

#### *1.00 to 4.00 Credits*

Individualized instruction in writing for publication within a workshop environment. Prerequisites: ENGL 204 and either 243 or 443.

### **380 - LITERARY JOURNALISM**

#### *4.00 Credits*

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

### **384 - DIRECTED READING**

#### *1.00 Credit*

Independent reading and tutorial under the supervision of an instructor. This course begins the senior essay sequence, which continues with ENGL 483-485. Usually taken during the spring quarter of the junior year. Open only to junior and senior English majors. Graded S/U. Prerequisites: ENGL 210 and ENGL 204 or HONR 200 or 205 or 212.

### **390 - SPECIAL TOPICS IN ENGLISH**

#### *1.00 to 4.00 Credits*

May be repeated as the topic varies.

Prerequisites: ENGL 210 and ENGL 204 or HONR 200 or 205 or 212.

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400-level courses are designed for English majors and minors. Prerequisites for ENGL 405, 443, and 470: ENGL 204 and 210; two other 200/300-level English courses recommended. Prerequisites for other 400-level courses: ENGL 204 and 210; two other 200/300-level literature courses recommended.

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### **405 - CULTURAL STUDIES**

#### *4.00 Credits*

Criticism of popular culture, theory, and practice, with focus on contemporary concepts of culture, textuality, and ideology. Prerequisites: ENGL 210 and ENGL 204 or HONR 200 or 205 or 212.

### **410 - CHAUCER**

#### *4.00 Credits*

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

Prerequisites: ENGL 204 and 210.

### **412 - SHAKESPEARE STUDIES**

#### *4.00 Credits*

Close reading and analysis of Shakespeare's plays within their historical context, using a variety of critical approaches. May be repeated as content varies. Prerequisites: ENGL 204 and 210.

### **420 - DEPARTMENT NEWSLETTER**

#### *1.00 to 3.00 Credits*

Writing and laying out the annual department newsletter. May be repeated up to a maximum of 4 hours. English majors only.

### **430 - READINGS IN ENGLISH LANGUAGE LITERATURE**

#### *4.00 Credits*

Major works in world literatures written in English from such regions as India, Anglophone Africa, Australia, and the Caribbean, with attention to cultural context. This course satisfies the Arts and Sciences non-Western requirement.

Prerequisites: ENGL 204 and 210.

### **431 - READINGS IN AMERICAN LITERATURE**

#### *4.00 Credits*

A major writer, genre, or theme in American literature, with attention to cultural context.

Prerequisites: ENGL 204 and 210.

### **432 - STUDIES IN COMPARATIVE LITERATURE**

#### *4.00 Credits*

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

Prerequisites: ENGL 204 and 210.

### **443 - NONFICTION WRITING**

#### *4.00 Credits*

A literary approach to the reading and writing of nonfiction essays. Prerequisites: ENGL 204 and 210.

### **451 - LITERARY CRITICISM**

#### *4.00 Credits*

Major literary theories of the twentieth century and their historical antecedents, with emphasis on theories currently practiced in university classes and academic journals. (Formerly ENGL 381) Prerequisites: ENGL 210 and ENGL 204 or HONR 200 or 205 or 212.

### **452 - RHETORICAL THEORY**

#### *1.00 to 6.00 Credits*

History and theory of rhetoric and its practice in contemporary public discourse and media.

Prerequisite: ENGL 210.

### **470 - EDITING**

#### *4.00 Credits*

Editing techniques and concerns critical to producing polished writing on a variety of levels, from corporate communications to book publishing. Prerequisites: ENGL 210 and ENGL 204 or HONR 200 or 205 or 212.

### **481 - INTERNSHIP**

#### *1.00 to 16.00 Credits*

Internships in English are designed to provide practical experience outside the classroom and to enhance the student's professional interests. May be repeated up to a maximum of 16 hours. Prerequisites: Courses appropriate for the internship. Graded S/U.

### **483 - READING FOR THE SENIOR ESSAY**

#### *1.00 Credit*

Independent reading in preparation for the senior essay. Prerequisite: ENGL 384. Graded S/U.

### **484 - SENIOR ESSAY 1**

#### *1.00 Credit*

Writing of a rough draft of the Senior Essay.

Prerequisite: ENGL 483.

### **485 - SENIOR ESSAY 2**

#### *2.00 Credits*

Final draft and oral presentation of the Senior Essay. Prerequisite: ENGL 484.

### 490 - SPECIAL TOPICS IN ENGLISH

1.00 to 4.00 Credits

May be repeated as the topic varies.

Prerequisites: ENGL 204 and 210

### 497 - INDEPENDENT STUDY IN LITERATURE

1.00 to 4.00 Credits

May be repeated as the topic varies.

Prerequisites: ENGL 210 and ENGL 204 or HONR 200 or 205 or 212.

### 498 - INDEPENDENT STUDY IN WRITING

1.00 to 4.00 Credits

May be repeated as the topic varies.

Prerequisites: ENGL 210 or ENGL 204 or HONR 200 or 205 or 212.

### 499 - INDEPENDENT STUDY IN JOURNALISM

1.00 to 4.00 Credits

May be repeated as the topic varies.

Prerequisites: ENGL 210 and ENGL 204 or HONR 200 or 205 or 212.

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## DEPARTMENT OF HISTORY, POLITICAL SCIENCE, AND CRIMINAL JUSTICE

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Professors Lomax, Loughlin, Ludanyi, J. Scott; Visiting Professor Cupp; Associate Professors D. Smith, Wilson (*Chair*); Assistant Professors Alexander, Moore; Visiting Assistant Professor Schuck

### Mission Statement

The department, as part of Ohio Northern University, helps to assist the students' development into self-reliant individuals. The department places special emphasis in the development of diverse ideas within the historical, political, and legal realm and furthers students' understanding of the world through the development and enhancement of critical thinking skills.

The **Wilfred E. Binkley Chair of History and Political Science**, inaugurated in 1971, has been made possible by a grant from the Scaife Foundation of Pittsburgh. The 2002-03 recipient of this professorship is Ellen S. Wilson, associate professor of history.

The **Kernan Robson Chair of Government**, inaugurated in 1972, has been made possible by a trust established by the late Kernan Robson. The 2002-03 recipient of this professorship is JoAnn M. Scott, professor of political science.

The department offers separate majors in history, political science, criminal justice, international studies and social studies. Minors in Public History/Museum Studies, Geography/GIS, Geography/Area Studies, as well as history, political science and criminal justice and options in Forensic Science and Leadership Studies are offered. An Archaeo-

logical Field School is also available. To pursue a dual major or a major and minor, students must complete all the requirements for each separate major and minor.

Majors in history and political science prepare students generally for careers in teaching, law, journalism, government service, or business. A history major in combination with a minor in Public History/Museum Studies prepares students to move into entry level positions in either curatorial or managerial fields. Criminal justice prepares students for employment in law enforcement, corrections, and court management. An option in Forensic Science or a minor in Geography/GIS provides direction for the Criminal Justice major and develops practical skills that are of increasing value in the workplace. International studies majors prepare for careers in government or business. A major in social studies will qualify the student for licensure in integrated social studies by the State Department of Education of Ohio. There are special departmental advisors for prelaw and teacher licensure.

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

The department participates in study-abroad programs. Students majoring in history are encouraged to consider a year abroad at University of Joensuu, the University of Wales, Lampeter, or University of Debrecen in Debrecen, Hungary. Political science, criminal justice, and international studies majors are directed toward Glasgow Caledonian University, University of Debrecen, or the University of Joensuu.

### Major in History

Specific requirements for the history major:

HSPS 000	Orientation	1 hour
HIST 110-111	West. Civ. 1 & 2	8 hours
HIST 204	Historiography	4 hours
PLSC 201	Intro. to Amer. Govt.	4 hours
PLSC 202	State and Local Politics	4 hours
HIST 214-215	U.S. History 1 & 2	8 hours
HSPS 222-25	One cont. course	4 hours
	or GEOG 226	
HIST 488-489	Sr. Research 1 & 2	3 hours
28 hours history electives at 300 or 400 level, distributed as follows:		
HIST, HSPS	World History	8 hours
HIST, HSPS	U.S. History	8 hours
HIST, HSPS	Electives	12 hours
AASG 300	Job/Grad Search	1 hour

## Minor in History

HIST 110-111	West. Civ. 1 & 2	8 hours
HIST 204	Historiography	4 hours
HIST 214-215	U.S. History 1 & 2	8 hours
HSPS 222-25	One cont. course or GEOG 226	4 hours

The following must be at the 300 or 400 level:

HIST, HSPS	World History	4 hours
HIST, HSPS	U.S. History	4 hours
HIST, HSPS	Elective	4 hours

## Major in Political Science

Specific requirements for the political science major are:

HSPS 000	Orientation	1 hour
PLSC 105	Mod. Pol. Conflicts	4 hours
ISR 253-254	Research Methods 1 & 2	8 hours
PLSC 201	Intro. to Amer. Govt.	4 hours
PLSC 202	State and Local Politics	4 hours
HIST 214 or 215	U.S. History 1 or 2	4 hours
HSPS 222-25	One cont. course or GEOG 226	4 hours
HSPS 458 or 459	West. Pol. Thgt. 1 or 2	4 hours
PLSC 488-489	Sr. Research 1 & 2	3 hours

28 hours political science electives at 300 or 400 level, distributed as follows:

PLSC, HSPS	American politics	8 hours
PLSC, HSPS	World politics	8 hours
PLSC, HSPS	Electives	12 hours
AASG 300	Job/Grad Search	1 hour
STAT 142	Intro. to Statistics	4 hours

## Minor in Political Science

PLSC 105	Mod. Pol. Conflicts	4 hours
ISR 253-254	Research Methods 1 & 2	8 hours
PLSC 201	Intro. to Amer. Govt.	4 hours
PLSC 202	State and Local Politics	4 hours
HSPS 222-25	One cont. course or GEOG 226	4 hours
HSPS 458 or 459	West. Pol. Thgt. 1 or 2	4 hours

The following courses must be at the 300 or 400 level:

PLSC, HSPS	Am. politics	4 hours
PLSC, HSPS	World politics	4 hours
PLSC, HSPS	Elective	4 hours

## Major in Criminal Justice

Specific requirements for the Criminal Justice major:

HSPS 000	Orientation	1 hour
PLSC 121	Intro. to Crim. Justice	4 hours
PLSC 122	Police in America	4 hours
PLSC 123	Corrections	4 hours
ISR 253-254	Research Methods 1 & 2	8 hours
PLSC 202	State and Local Politics	4 hours
SOC 261	Criminology	4 hours
PLSC 342	Judicial Process and Criminal Law	4 hours
PLSC 351	Con. Law and Civil Lib.	4 hours
SOC 361	Delinq. & Juv. Just.	4 hours

PSYC 215, 311, 320, 420, or PSSC 301		8 hours
HSPS 311, PLSC 230, 355, 366, 391, 491		8 hours
SOC 240, 243, 246, 247, 263, 361		8 hours
	Crim. Justice elective	4 hours
PLSC 488-489	Sr. Research 1 & 2	3 hours
AASG 300	Job/Grad Search	1 hour
STAT 142	Intro. to Statistics	4 hours

## Minor in Criminal Justice

PLSC 121	Intro. to Crim. Justice	4 hours
PLSC 122	Police in America	4 hours
PLSC 123	Corrections	4 hours
SOC 261	Criminology	4 hours
PLSC 342	Judicial Process	4 hours
SOC 361	Delinquency	4 hours
	Crim. Justice electives	12 hours

The electives are taken in two of the following disciplines (political science, psychology, and /or sociology) and outside the student's major. These courses must be taken from among those approved for the major. All criminal justice minors must take at least one course in psychology and demonstrate competence in social science methods.

## Major in International Studies

Core requirements for the International Studies major:

HSPS 000	Orientation	1 hour
PLSC 107	Intro. to Int'l. Studies	4 hours
HIST 204 ISR 253-254	Historiography or Research Methods 1 & 2	4 or 8 hours
HSPS 222-25	One cont. course	4 hours
GEOG 226	World Regional Geog.	4 hours
HIST 384	Modern Europe 2	4 hours
PLSC 388	Int'l. Relations & Law	4 hours
HSPS 395	Int'l. Studies Seminar	4 hours
HSPS 452	Am. Foreign Relations	4 hours
HIST, PLSC, or HSPS 488, 489	Sr. Research 1 & 2	3 hours
AASG 300	Job/Grad Search	1 hour
STAT 142	Intro. to Statistics	4 hours

Academic or employment experience abroad

Cognate: Second-year proficiency in a modern language plus one advanced course approved by the department of modern languages.

In addition to the core requirements, students take five courses in Social Sciences **OR** five courses at the 300 or 400 level in their second language or another language other than their own **OR** the business option.

This provides maximum flexibility for students to develop a course of study most appropriate to their interests and goals. In all cases, the selections of electives must be done in close consultation with the student's advisor in International Studies.

## Minor in Geography/Area Studies

Core courses:

GEOG 226	World Regional Geog.	4 hours
GEOG 237	Physical Geography	4 hours
GEOG 248	Introduction to GIS	4 hours
		12 hours

Modern Language:

1 year required, 2 years recommended



Two regions from: (8 credit hours)		
HSPS 222	Contemporary Africa	4 hours
HSPS 223	Contemporary Asia	4 hours
HSPS 224	Contemporary Middle East	4 hours
HSPS 225	Contemporary Latin America	4 hours
HIST 384	Modern Europe 2	4 hours
PLSC 416	East Central Europe & Russia	4 hours

Electives: (8 credit hours)		
PLSC 107	Intro. to Int'l. Studies	4 hours
PLSC 336	Developing Pol. Systems	4 hours
PLSC 475	Model United Nations	1-4 hours
HIST 384	Modern Europe 2	4 hours
PLSC 416	East Central Europe & Russia	4 hours
GEOG 348	Applied GIS	4 hours

## Minor in Geography/GIS

Core courses:		
GEOG 226	World Regional Geog.	4 hours
GEOG 237	Physical Geography	4 hours
GEOG 248	Intro. to GIS	4 hours
GEOG 268	Intro. to Cartography	4 hours
GEOG 348	Applied GIS	4 hours
GEOG 481	GIS Internship	<u>1-8 hours</u> 21-28 hours

Cognates:		
STAT 142	Intro. to Statistics	4 hours
ISR 253	Research Methods 1	4 hours
ISR 254	Research Methods 2	<u>4 hours</u> 12 hours

## Minor in Public History/Museum Studies

Core Courses:		
HIST 230	Intro. to Museums & Archives	4 hours
GEOG 248	Intro. to GIS	4 hours
HIST 320	Adv. Public History	4 hours
HIST 330	Adv. Local History	4 hours
HIST 308	Material Culture	4 hours
HIST 481	Public Service Internship*	or
HIST 482	Archaeology Field School	<u>4 hours</u> 24 hours

Managerial Track (12 credit hours)		
COMM 130	Intro. to Public Relations	4 hours
COMM 380	Arts Administration	4 hours
MRKT 351	Prin. of Marketing	4 hours
MGMT 333	Management and Organization Behavior	4 hours

Note: COMM 211 and COMM 225 are strongly recommended

Curatorial Track (12 credit hours)		
ART 100	Art	4 hours
ART 222	Graphic Design 1	4 hours
ART 223	Graphic Design 2	4 hours
ART 250	Cultural Anthropology	4 hours
HIST 301	Intro. to Family History and Genealogy	4 hours

Note: For non-art majors, Art History 1, 2, and 3 as well as Graphic Design 3 are recommended in addition to three selections from the Curatorial Track.

COMM 211 is recommended to meet the General Education requirement.

\*This requirement can be substituted with similar offerings in respective student disciplines (e.g. ART 471 Internship for Art majors).

## Options

Options in accounting, business and economics are available to any department major. They are designed to give direction and depth to areas of study related to the major. The courses for the option are in addition to major course work, and the selection of electives must be done in close consultation with the student's advisor. See business options under Arts and Sciences description.

## Forensic Science Option in Criminal Justice

BIOL 121	General Biology	4 hours
BIOL 122	Intro to Zoology	4 hours
BIOL 210	Introductory Genetics	4 hours
BIOL 217	Intro to Molecular Bio.	4 hours
BIOL 302	Human Anatomy	4 hours
and either		
CHEM 100	Chemistry	4 hours
CHEM 114	Chemistry of Life	4 hours
CHEM 115	Environmental Chem.	4 hours
Or		
CHEM 171	Introductory Chem. 1	5 hours
CHEM 172	Introductory Chem. 2	5 hours
CHEM 173	Introductory Chem. 3	5 hours

PLSC 211,212	Intro Forensic Science1,2	8 hours
PLSC	Criminal Investigation	4 hours

## Leadership Studies Option

Leadership Core:		
Leadership Seminar 1,2, 3*		6 hours
Leadership Practicum		1-3 hours
OR		
Leadership Practicum 1, 2, 3		6 hours
PHIL 238	Ethics	
OR		
PHIL 336	Ethics in Professional Life	4 hours
MGMT 333	Mgmt. and Org. Behavior	4 hours
COMM 225	Interpersonal Com.	4 hours
COMM 311	Persuasive Speaking	4 hours
PLSC 409	The Presidency	
OR		
PLSC 366	Public Administration and Policy Analysis	4 hours

Electives: 8 hours from the following:\*\*

COMM 221	Interviewing
COMM 321	Group Communication
COMM 345	Organizational Communication
COMM 440	Comm. and Conflict Management
MGMT 363	Human Resource Management

MGMT	410	Business and Society
PLSC	342	Judicial Process and Criminal Law
PLSC	366	Public Admin. and Policy Analysis
PLSC	409	The Presidency
PLSC	411	Congress
PSYC	311	Psychology of Personality
SOC	247	Social Stratification
SOC	250	Cultural Anthropology

35 (34) hrs.

\*The Leadership Studies Committee will accept applications for admission to the Leadership Seminar. Students not admitted to the Seminar may complete the option by taking the Leadership Practicum.

\*\*Electives must represent two different disciplines and may not be in discipline of primary major. Students enrolled in ROTC may substitute Professionalism/Leadership ARMY 301 for 4 elective hours.

### Teacher Licensure with Major in Social Studies

HSPS	000	Orientation	1 hour
HIST	004	Teacher Licensure Ori.	1 hour
HIST	110-111	West. Civ. 1 & 2	8 hours
HIST	214-215	U.S. History 1 & 2	8 hours
HIST	303	Ohio History	4 hours
HIST	365	African-Am. History	4 hours
HIST/HSPS	300/400 level	Am. History Elective	4 hours
HIST/HSPS	300/400 level	Eur. History Elective	4 hours
HIST	204 or ISR 253-254	Historiography or Research Methods 1 & 2	4 or 8 hours
PLSC	107, HSPS 222-225	Intro. to Int'l Studies, Contemporary Affairs	4 hours
GEOG	226	World Regional Geog.	4 hours
PLSC	201	Intro. to Amer. Govt.	4 hours
PLSC	202	State and Local Politics	4 hours
PLSC/HSPS	300/400 level	Elective	4 hours
IBEC	202	Microeconomics	4 hours
IBEC	203	Macroeconomics	4 hours
PSSC	301	Social Psychology	4 hours
PSYC	100	Psychology	4 hours
SOC	105	Sociology	4 hours
SOC	250	Cultural Anthropology	4 hours
GEOG	237	Physical Geography	4 hours
HIST/HSPS	488,489	Senior Research 1 & 2	3 hours
AASG	300	Job/Grad Search	1 hour
Professional Education courses			50 hours

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

## Subject - Geography (GEOG)

### 193 - SPECIAL TOPICS IN GEOGRAPHY

1.00 to 4.00 Credits

Can be repeated as the topic varies.

### 226 - WORLD REGIONAL GEOGRAPHY

4.00 Credits

A regional survey of the non-Western world, including its leading cultural, economic, historical, political and appropriate environmental features. Open to freshmen. Does not satisfy humanities requirement. Formerly HSPS 226.

### 237 - PHYSICAL GEOGRAPHY

4.00 Credits

Basic concepts in physical geography. Topics covered include: the atmosphere, the biosphere, the lithosphere, and the hydrosphere. Emphasis on processes driving physical systems on the earth, interactions among physical systems, human interaction with the physical environment, and understanding the basic physical geographic processes and the global geographic patterns resulting from those processes.

### 248 - INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS

4.00 Credits

The fundamentals of geographic information systems (GIS) includes basic cartographic principles. An introduction to the incorporation of the Global Positioning System (GPS) into GIS, and the necessary hardware and software elements used in GIS. Lab exercises in various applications of GIS technology used in environmental science, business, government, and criminal justice. Lecture topics include understanding of GIS terminology, raster and vector data structures, data sources and accuracy, methods of data acquisition, conversion, and input, working with spatial databases and spatial analysis. Does not satisfy Social Science distribution requirement. Prerequisite: working knowledge of Windows operating system.

### 268 - CARTOGRAPHY

4.00 Credits

The art and science of making maps. The history of maps, elements of map construction and properties of map projections, and how to construct different kinds of thematic maps and manipulate geographic data to illustrate characteristics of distribution, concentration or other geographic patterns that promote interpretation of the earth's features. Exercises require work in the computer lab outside class hours. Offered alternate years.

### 293 - SPECIAL TOPICS IN GEOGRAPHY

1.00 to 4.00 Credits

Can be repeated as the topic varies.

### **348 - APPLIED GEOGRAPHIC INFORMATION SYSTEMS**

#### *4.00 Credits*

A continuation of GEOG 248, Geographic Information Systems (GIS). More advanced discussion on spatial interpolations, error and uncertainty, Global Positioning Systems (GPS), and spatial model-building. Advanced knowledge of GIS theory and science. Computer lab projects will be geared toward the relevant major. Offered alternate years. Prerequisite: GEOG 248.

### **393 - SPECIAL TOPICS IN GEOGRAPHY**

#### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **481 - PUBLIC SERVICE INTERNSHIP PROGRAM**

#### *1.00 to 16.00 Credits*

Field experiences in the area of public service. Work in a close relationship with public offices and officials. Interns service in a local agency receive four credit hours for ten hours of service per week. Those who work full-time for a quarter receive 16 credit hours. A maximum of 6 hours will count toward major requirements. Graded S/U. Prerequisites: Consultation with the department internship committee and completion of the application process, a 2.75 GPA, and junior or senior status.

### **493 - SPECIAL TOPICS IN GEOGRAPHY**

#### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **496 - INDEPENDENT STUDY IN GEOGRAPHY**

#### *1.00 to 4.00 Credits*

Approval of department chairman required prior to registration.

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## **Subject - History (HIST)**

### **004 - TEACHER LICENSURE ORIENTATION**

#### *1.00 Credit*

Familiarity with standards for admission to the Teacher Education Program and direction for successful completion of licensure program. Credit earned in this course does not satisfy graduation requirements for any program offered at the university. Graded S/U. Prerequisite: Social studies majors or considering licensure in social studies.

### **110 - WESTERN CIVILIZATION 1**

#### *4.00 Credits*

Ideas, attitudes, and institutions basic to civilization as it developed in the West from ancient times to the seventeenth century.

### **111 - WESTERN CIVILIZATION 2**

#### *4.00 Credits*

Ideas, attitudes, and institutions basic to civilization as it developed in the West from the seventeenth century to the present.

### **120 - PUBLIC HISTORY**

#### *4.00 Credits*

The application of history through discussions, demonstrations, readings and fieldwork on a variety of public history topics including museums and historical societies, historic preservation, material culture, popular culture, and family and ethnic group history.

### **130 - LOCAL HISTORY**

#### *4.00 Credits*

Significant aspects of local history for reference and teaching purposes. Investigation, examination and study of a variety of topics and trends in local history theory and practice through readings, discussions, demonstrations, and field trips.

### **190 - SPECIAL TOPICS IN HISTORY**

#### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **204 - HISTORIOGRAPHY**

#### *4.00 Credits*

Western historical thought from the Greeks to the present. Research methods for history majors and minors and social studies majors. Requires a fully documented research paper on an historical topic. Prerequisite: sophomore status.

### **214 - UNITED STATES HISTORY TO 1865**

#### *4.00 Credits*

American colonies and United States from 1492 to 1865. Emphasis is placed on the formation of American political, economic, and social attitudes and their application in the early Republic.

### **215 - UNITED STATES HISTORY SINCE 1865**

#### *4.00 Credits*

The United States since the Civil War. Major topics include the role played by the US in global affairs and US domestic policy.

### **230 - INTRODUCTION TO MUSEUMS AND ARCHIVES**

#### *4.00 Credits*

The theoretical, administrative, and curatorial aspects of museum and archival management and practice. Topics include the growth of museums and archives, the development of private and public institutions, and the manner in which museum and archival collections are gathered, catalogued, utilized, stored, and made available for research, educational and exhibition purposes.

### **290 - SPECIAL TOPICS IN HISTORY**

#### *1.00 to 4.00 Credits*

Can be repeated as topic varies.

### **301 - INTRODUCTION TO FAMILY HISTORY AND GENEALOGY**

#### *1.00 to 4.00 Credits*

The importance of genealogical research and practice for understanding family history and social development. Exploration of family records; local, state, and federal records; church records; census records; land and probate records and documents; school records; immigration lists and naturalization records; and miscellaneous records used to document specific ethnic origins. Offered alternate years.

### **302 - WEEKEND SEMINAR**

#### *1.00 Credit*

A weekend seminar at the Metzger Nature Center, Bolon Hall. Topics include Ohio Prehistory, Historical Archaeology, The Society of Separatists at Zoar, Religion on the Frontier, Tuscarawas County and the Settlement of the Northwest Territory, Native-American Culture and Life in the 18th Century Ohio, Industrial Revolution in Eastern Ohio, the Moravian Missions, Water Sources for Transportation and Development, Politics in Eastern Ohio. A Nature Center use fee is charged.

### **303 - OHIO HISTORY**

#### *4.00 Credits*

The political and cultural evolution of Ohio from the prehistoric period to the late 19th century. Emphasis placed on the 18th and early 19th century.

### **308 - MATERIAL CULTURE**

#### *4.00 Credits*

Material culture as a means of understanding history and the built environment. Interdisciplinary trends in the theory and methodology, and the importance of material culture analysis in understanding issues such as consumption, fashion, gender, technology, built form, and popular contemporary culture. Offered alternate years.

### **320 - ADVANCED PUBLIC HISTORY**

#### *4.00 Credits*

The application and understanding of public history through discussion, readings, demonstrations, and fieldwork on a variety of applied history topics. Research topics related to museums and historical societies and the role they play in society, historic preservation, material culture and its uses, and popular culture. All course work will be associated with the particular discipline of the student.

### **330 - ADVANCED LOCAL HISTORY**

#### *4.00 Credits*

Aspects of local history for reference and teaching purposes. Focus on trends in local history theory and practice through readings, discussions, demonstrations, field trips and independent research.

### **361 - RECENT AMERICAN HISTORY 1**

#### *4.00 Credits*

The history of the United States from the beginning of World War I until the conclusion of World War II. Formerly HSPS 361.

### **362 - RECENT AMERICAN HISTORY 2**

#### *4.00 Credits*

The history of the United States from the conclusion of World War II to the present-day. Formerly HSPS 362.

### **365 - AFRICAN-AMERICAN HISTORY**

#### *4.00 Credits*

The essential facts, trends, and interpretations in African-American history from the African beginnings to the present-day.

### **372 - THE ANCIENT WORLD**

#### *4.00 Credits*

The political, social, economic, and cultural development of the Near Eastern, Greek, and Roman civilizations of antiquity.

### **373 - MEDIEVAL EUROPE**

#### *4.00 Credits*

The political, social, economic, and cultural development of Europe from the decline of the Roman Empire to the beginning of the Renaissance, with special attention to the emergence of institutions that shaped the modern world.

### **374 - RENAISSANCE AND REFORMATION**

#### *4.00 Credits*

The evolution of the Italian communes. European cultural movements from the fourteenth through the sixteenth centuries. The Church and European society in the later Middle Ages, the Protestant Reformation, the Catholic Reformation, and the Wars of Religion.

### **382 - ABSOLUTISM, ENLIGHTENMENT, AND THE FRENCH REVOLUTION**

#### *4.00 Credits*

European history from the Treaty of Westphalia to the French Revolution. The rise of the modern state, the ancient regime, the origins and nature of the French Revolution, and the coming of Napoleon are stressed. Offered alternate years. Formerly 322, 375 and 376.

### **383 - HISTORY OF MODERN EUROPE 1**

#### *4.00 Credits*

European history from 1815 to the era before World War I. This course covers Europe from the age of Reaction and the Romantics to the age of Realism, Naturalism, and Modernism.

### **384 - HISTORY OF MODERN EUROPE 2**

#### *4.00 Credits*

European history from the origins of World War I to the collapse of the Soviet Empire and the evolution of the European community.

**390 - SPECIAL TOPICS IN HISTORY**

*1.00 to 4.00 Credits*

Can be repeated as topic varies.

**415 - RUSSIAN HISTORY TO 1815**

*4.00 Credits*

The social, political and economic development of the Russian state from ancient Kiev to Appanage Russia and the Mongol invasion to the Muscovite State of Ivan the Dread, the Time of Troubles, and the Romanov Dynasty to 1815. Formerly HSPS 415.

**451 - HISTORY OF LAW**

*4.00 Credits*

The evolution of law as an instrument of dispute resolution and social control. The development of the Roman and civil law tradition and the English common law tradition to the seventeenth century.

**454 - CIVIL WAR AND RECONSTRUCTION**

*4.00 Credits*

Causes, duration, and consequences of the American Civil War.

**461 - TOPICS IN NORTH AMERICA TO 1783**

*4.00 Credits*

Topics such as: Religion in America, the French in North America, Colonial North America, the British in North America, Revolutionary America, Race and Gender in America. Formerly HIST 355. May be repeated as topic varies.

**462 - TOPICS IN NORTH AMERICA SINCE 1783**

*4.00 Credits*

Includes topics such as: the Early Republic, Religion in America, the War of 1812, Mid-19th Century Politics in North America, Race and Gender in North America, and Environmental History. May be repeated as topic varies.

**463 - TOPICS IN MODERN EUROPE**

*4.00 Credits*

Topics include but are not limited to World War I, the Rise of Fascism, Hitler and Nazism, the European Community, and the European Avant-Garde, Existentialism, and Deconstruction. May be repeated as topic varies.

**471 - HISTORY OF THE OTTOMAN EMPIRE**

*4.00 Credits*

The emergence, expansion and decline of Turkish power in South-Eastern Europe, Asia Minor, the Middle East and North Africa from the time of the Seljuks to the Young Turks, with particular emphasis on this non-Western empire's military, political and cultural legacy.

**481 - PUBLIC SERVICE INTERNSHIP PROGRAM**

*1.00 to 16.00 Credits*

Field experience in the area of public service. Work in a close relationship with public offices and officials. Interns serving in a local agency receive four credit hours for ten hours of service per week. Those who work full-time for a quarter receive 16 credit hours. A maximum of 6 hours will count toward major requirements. Graded S/U. Prerequisites: Consultation with the department internship committee and completion of the application process, a 2.75 GPA, and junior or senior status.

**482 - FIELD SCHOOL IN ARCHAEOLOGY**

*4.00 Credits*

Basic archaeology and archaeological field work. Curriculum includes survey and excavation; basic geophysical survey methods; preparation of field notes and documentation; and instruction in other fundamental field skills.

**488 - SENIOR RESEARCH PAPER 1**

*1.00 Credit*

Topic selection, development of bibliography and outline for senior paper (See HIST 489) directed by a departmental faculty member. Required of all departmental majors. Students will enroll in this course at least two quarters before the quarter in which they expect to graduate. Prerequisites: Senior status; major in History or International Studies.

**489 - SENIOR RESEARCH PAPER 2**

*2.00 Credits*

Writing of a research paper directed by a department faculty member relevant to their major. Required of all departmental majors. Enrollment before the quarter of expected graduation. Prerequisite: HIST 488.

**490 - SPECIAL TOPICS IN HISTORY**

*1.00 to 4.00 Credits*

Can be repeated as topic varies.

**494 - SEMINAR IN HISTORY**

*1.00 to 4.00 Credits*

Can be repeated as topic varies.

**497 - INDEPENDENT STUDY IN HISTORY**

*1.00 to 4.00 Credits*

Approval of department chairman required prior to registration.

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**Subject - History, Political Science and Criminal Justice (HSPS)**

**000 - HISTORY AND POLITICAL SCIENCE ORIENTATION**

*1.00 Credit*

Familiarization with the department, requirements for majors, planning a program of courses, the catalog, careers, the library and university services. Required of majors in history, political science, criminal justice, international studies, and social studies. Graded S/U.

**192 - SPECIAL TOPICS - HISTORY AND POLITICAL SCIENCE**

*1.00 to 4.00 Credits*

Can be repeated as the topic varies.

**222 - CONTEMPORARY ASIA**

*4.00 Credits*

The ways in which Asia has been shaped through culture, politics, art, religion, economics and family. The primary focus is on events since World War II. Open to freshmen.

**223 - CONTEMPORARY AFRICA**

*4.00 Credits*

Political, socioeconomic, and intellectual development of Africa since the conclusion of World War II. Open to freshmen.

**224 - CONTEMPORARY MIDDLE EAST**

*4.00 Credits*

The political, socioeconomic and intellectual development of the Middle East since the conclusion of World War II. A survey of the clash of Western and non-Western power centers in the region. Open to freshmen.

**225 - CONTEMPORARY LATIN AMERICA**

*4.00 Credits*

Political, economic, social, and cultural development of Latin America. The primary focus is on events since World War II. Open to freshmen.

**292 - SPECIAL TOPICS - HISTORY AND POLITICAL SCIENCE**

*1.00 to 4.00 Credits*

Can be repeated as the topic varies.

**311 - URBAN HISTORY AND POLITICS**

*4.00 Credits*

The historical development of American cities and the contemporary problems faced by cities and their suburbs.

**378 - INTRODUCTION TO CANADIAN STUDIES**

*4.00 Credits*

Canada's history, politics, geography, environment, economics and literature. Interdisciplinary, team taught. Formerly HSPS 278.

**392 - SPECIAL TOPICS - HISTORY AND POLITICAL SCIENCE**

*1.00 to 4.00 Credits*

Can be repeated as the topic varies.

**395 - SEMINAR IN INTERNATIONAL STUDIES**

*4.00 Credits*

An in-depth multidisciplinary analysis of a global crisis, an international regional concern, or an issue in global politics. An integrating experience for international studies majors. Focuses on timely or weighty problems in terms of their long-term implications for the international and inter-state stability and order of the world. Prerequisite: HIST 204 or PLSC 253 and 254.

**452 - AMERICAN FOREIGN RELATIONS**

*4.00 Credits*

An analytical and conceptual overview of the nature of American Foreign Policy decision-making with a use of case studies to uncover the variables at play in recent American Foreign Policy.

**458 - WESTERN POLITICAL THOUGHT 1**

*4.00 Credits*

Western political theory commencing with Plato, Aristotle, and the Stoics. Proceeds through Machiavelli and finishes with the Reformation and the wars of religion with an emphasis on their political implications.

**459 - WESTERN POLITICAL THOUGHT 2**

*4.00 Credits*

Western political theory commencing with the Enlightenment and ending with John Rawls. Constitutionalism, contract theory, conservatism, idealism, liberalism, utilitarianism, Marxism, anarchism, socialism, fascism, feminism, and environmentalism shall be considered.

**481 - PUBLIC SERVICE INTERNSHIP**

*1.00 to 16.00 Credits*

Field experience in the area of public service. Work in a close relationship with public offices and officials. Interns serving in a local agency receive four credit hours for ten hours of service per week. Those who work full-time for a quarter receive 16 credit hours. A maximum of 6 hours will count toward major requirements. Graded S/U. Prerequisites: Consultation with the department internship committee and completion of the application process, 2.75 GPA, and junior or senior status.

**488 - SENIOR RESEARCH PAPER 1**

*1.00 Credit*

Topic selection, development of bibliography and outline for senior paper (See HSPS 489) directed by a departmental faculty member. May be used as a substitute for HIST 488 or PLSC 488 for students completing a dual major within the department. Prerequisites: Senior standing and dual major.

## **489 - SENIOR RESEARCH PAPER 2**

### *2.00 Credits*

Writing of a research paper directed by a department faculty member relevant to their majors. Open to all dual departmental majors. Enrollment before the quarter of expected graduation. Prerequisite: HSPS 488.

## **492 - SPECIAL TOPICS - HISTORY AND POLITICAL SCIENCE**

### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

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## ***Subject - Leadership Studies (LEAD)***

## **493 - FOUNDATIONS OF LEADERSHIP**

### *2.00 Credits*

Leadership and how it works. Topics include theories, definitions and models of leadership. Participants interview contemporary leader, analyze that leader's style, and complete a personal vision statement. Prerequisite: Junior standing and above.

## **494 - ISSUES IN CONTEMPORARY LEADERSHIP**

### *2.00 Credits*

Effective leadership in the contemporary setting. Topics include using personal leadership to improve communities; leadership in an era of social, cultural, racial and gender diversity; balancing commitments to career, family and community; and the future of leadership. Participants will link with an experienced leader for participatory mentoring and report on their experience. Prerequisite: Junior standing and above.

## **495 - TECHNIQUES AND DYNAMICS OF LEADERSHIP**

### *2.00 Credits*

Effective techniques and the discernable dynamics of leadership. Topics include leading in groups, team building, problem solving and negotiation, leadership in crises, and getting a foothold in the real world. Participants will be involved in a civic engagement project or an alternate leadership project and report on the same. Prerequisite: Junior standing and above.

## **499 - LEADERSHIP PRACTICUM**

### *1.00 to 2.00 Credits*

A field experience in leadership with approval of the Leadership Studies Committee and the instructor. Significant involvement in a civic engagement project or have a major leadership role on campus. Maintenance of a journal that reflects the involvement and reactions to the experience. Additional requirements may be included in the contract. Can be repeated as topic varies. Prerequisite: Junior standing and above.

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## ***Subject - Political Science (PLSC) —***

## **105 - MODERN POLITICAL CONFLICTS AND ISSUES**

### *4.00 Credits*

A comparative examination of government structure, political attitudes and relations among nations.

## **107 - INTERNATIONAL STUDIES AND WORLD PROBLEMS**

### *4.00 Credits*

Introduction to the relations of states, governments, political movements and international organizations in the global context, particularly the non-Western world. A survey of the political actors and their objectives in a world of limited resources. Underdevelopment and an ongoing population crisis, with intense competition between the rich and the poor, the major powers and their client states and independence movements. Formerly HSPS 107.

## **121 - INTRODUCTION TO CRIMINAL JUSTICE**

### *4.00 Credits*

Concepts, issues, substance, structures of the American criminal justice system, causes of criminal behavior, theories of law and punishment, and the roles of various actors within the system.

## **122 - POLICE IN AMERICA**

### *4.00 Credits*

Historical, philosophical and legal basis of police institutions, practices and procedures. Issue oriented course and discussion topics will vary with prevailing issues. Formerly PLSC 241.

## **123 - CORRECTIONS**

### *4.00 Credits*

Historical, philosophical and legal basis of correctional procedures and institutions. Issue oriented course and discussion topics will vary with prevailing correctional issues. Formerly PLSC 245.

## **191 - SPECIAL TOPICS IN POLITICAL SCIENCE**

### *1.00 to 4.00 Credits*

Can be repeated as topic varies.

## **201 - INTRODUCTION TO AMERICAN GOVERNMENT**

### *4.00 Credits*

Introduction to the constitutional underpinnings, political behavior, processes, and institutions of American national government.

## **202 - STATE AND LOCAL POLITICS**

### *4.00 Credits*

Introduction to the underpinnings, political behavior, processes, and institutions found in American states and localities.

## **211 - INTRODUCTION TO FORENSIC SCIENCE 1**

### *4.00 Credits*

The history, structure and function of the modern forensic laboratory. The subject matter of the course is offered over a two-quarter sequence. A survey and presentation of the methodologies utilized by the individual forensic laboratory disciplines. The principle of transfer, crime scene analysis, collection of physical evidence and packaging, glass and soil analysis, fingerprint and latent prints as probative evidence, to the laboratory analyses proper use of the compound microscope for analysis of fibers, firearm and arson analysis and forensic toxicology. The legal aspects of the scientific basis and admissibility of evidence in court is discussed. Prerequisites: High school biology, chemistry and physics.

## **212 - INTRODUCTION TO FORENSIC SCIENCE 2**

### *4.00 Credits*

Introduction to the history, structure and function in the modern forensic laboratory. The subject matter of the course is offered over a two-quarter sequence. Didactic and laboratory presentation includes hands-on experience and demonstration of selected laboratory techniques. The course objectives are: scientific theory and background to the laboratory analyses of the modern forensic science laboratory including: organic, inorganic analysis, analysis of bloodstain and blood spatter including forensic serology and DNA analysis. Prerequisite: PLSC 211.

## **230 - POVERTY, INEQUALITY AND PUBLIC ISSUES**

### *4.00 Credits*

The nature, extent and causes of social mobility in American society, with particular emphasis on poverty, ethnic, racial and gender inequalities in this and other areas of socioeconomic attainment in the United States. The variety of (past, present or future) government actions and/or policies to promote upward mobility and eradicate social inequalities.

## **291 - SPECIAL TOPICS IN POLITICAL SCIENCE**

### *1.00 to 4.00 Credits*

Can be repeated as topic varies.

## **302 - WEEKEND SEMINAR**

### *1.00 Credit*

A weekend seminar at the Metzger Nature Center, Bolon Hall. Topics include Politics in Eastern Ohio, Water Sources for Transportation and Development, Politics and Rural America, and Current Issues in Political Science and Criminal Justice. A Nature Center use fee is charged.

## **306 - ENVIRONMENTAL LAW**

### *3.00 Credits*

The American legal system as it is used to preserve the nation's environment. Significant environmental laws and policies developed for implementation. Prerequisites: BIOL 251, CE 323, CE 371 or permission of instructor. Formerly HSPS 306.

## **321 - POLITICAL PARTIES AND INTEREST GROUPS**

### *4.00 Credits*

Examination of the formation, maintenance, and influence of interest groups and political parties in the United States.

## **323 - MASS POLITICAL BEHAVIOR**

### *4.00 Credits*

Examination of the theory, practice and role of voting behavior in the United States.

## **325 - TOPICS IN AMERICAN POLITICS**

### *4.00 Credits*

Topics include but are not limited to: Film and Politics, Popular Culture and Politics, Media and Politics, Sports and Politics. Can be repeated as topic varies.

## **334 - PARLIAMENTARY DEMOCRACIES**

### *4.00 Credits*

A comparison of the politics of contemporary parliamentary democracies, stressing the impact of political culture and the operations of governmental institutions, parties and interest groups in the process of public policy-making.

## **336 - DEVELOPING POLITICAL SYSTEMS**

### *4.00 Credits*

A comparison of contemporary politics in developing and non-Western societies, stressing the impact of cultural fragmentation, modernization, social unrest and rising expectations on the stability and effectiveness of governmental institutions and processes.

## **342 - JUDICIAL PROCESS AND CRIMINAL LAW**

### *4.00 Credits*

The roles of lawyers, judges, and juries and the organization and operation of federal and state courts, with special emphasis on criminal law procedure. Examination of selective substantive criminal statutes.

## **350 - CONSTITUTIONAL LAW AND GOVERNMENT**

### *4.00 Credits*

Social and political forces that shaped constitutional political theory and the interaction of law and politics through the Reconstruction era. Relationship of the Supreme Court vis-a-vis Congress, the executive, states, and emergency powers. Formerly HSPS 350.

## **351 - CONSTITUTIONAL LAW AND CIVIL LIBERTIES**

### *4.00 Credits*

Late nineteenth and twentieth century decisions of the Supreme Court with special attention directed to civil liberties, civil rights and criminal justice issues. Formerly HSPS 351.



### **355 - MINORITIES AND WOMEN IN CRIMINAL JUSTICE**

*4.00 Credits*

The role of minorities and women in the American criminal justice system. Issues relating to minorities and women as offenders, victims of crime, and criminal justice professionals will be presented and explored. Additionally, concepts such as racism, prejudice, discrimination and victimization will be examined. Prerequisite: PLSC 121.

### **366 - PUBLIC ADMINISTRATION AND POLICY ANALYSIS**

*4.00 Credits*

Bureaucrats as actors in the American political system, their sources of power, their relationship to elected public officials, the basic dynamics and problems in the policymaking process and widely used analytical approaches to public policy.

### **388 - INTERNATIONAL RELATIONS AND LAW**

*4.00 Credits*

The factors and forces which determine the policies of nation-states and the structure, operation and legal setting of international politics. Particular emphasis is on the role of IGO's and NGO's as well as the changing international legal order.

### **391 - SPECIAL TOPICS IN POLITICAL SCIENCE**

*1.00 to 4.00 Credits*

Can be repeated as topic varies.

### **409 - THE PRESIDENCY**

*4.00 Credits*

Examination of the development and contemporary operation of the Presidency.

### **411 - CONGRESS**

*4.00 Credits*

Examination of the structure and operation of Congress.

### **416 - EAST CENTRAL EUROPE AND RUSSIA**

*4.00 Credits*

A comparison of the politics of transition between autocratic and democratic political systems in the region formerly dominated by the Soviet Union, traced from Tsarist Russia through the Communist period to present efforts of democratization.

### **475 - MODEL UNITED NATIONS**

*1.00 to 4.00 Credits*

Preparation to participate in the National Model United Nations in New York City. An integrated and serious simulation of many aspects of the United Nations. Travel to New York City in the spring. May be repeated up to 12 credit hours, but only a maximum of 4 credit hours can count toward major or minor requirements. Up to 12 hours can fulfill graduation requirements. (Formerly HSPS 475)

### **476 - MOCK TRIAL**

*1.00 to 4.00 Credits*

Preparation to participate in both the regional and national mock trial competition held at the University of Toledo and Drake University, respectively. Preparation of both civil and criminal cases including opening and closing arguments, direct and cross examination of witnesses, and objections. May be repeated up to 12 credit hours, but only a maximum of 4 credit hours can count toward major or minor requirements. Up to 12 hours can fulfill graduation requirements. Prerequisite: Permission of the instructor. (Formerly HSPS 476)

### **481 - PUBLIC SERVICE INTERNSHIP PROGRAM**

*1.00 to 16.00 Credits*

Field experience in the area of public service. Work in a close relationship with public offices and officials. Interns serving in a local agency receive four credit hours for ten hours of service per week. Those who work full-time for a quarter receive 16 credit hours. A maximum of 6 hours will count toward major requirements. Graded S/U. Prerequisites: Consultation with the department internship committee and completion of the application process, a 2.75 GPA, and junior or senior status.

### **488 - SENIOR RESEARCH PAPER 1**

*1.00 Credit*

Topic selection, development of bibliography and outline for senior paper (see PLSC 489) directed by a departmental faculty member. Required of all departmental majors. Enrollment at least two quarters before expected graduation. Prerequisites: Senior status, major in Political Science, Criminal Justice or International Studies.

### **489 - SENIOR RESEARCH PAPER 2**

*2.00 Credits*

Writing of a research paper directed by a department faculty member relevant to their major. Required of all departmental majors. Enrollment one quarter before expected graduation. Prerequisite: PLSC 488.

### **491 - SPECIAL TOPICS IN POLITICAL SCIENCE**

*1.00 to 4.00 Credits*

Can be repeated as topic varies.

### **495 - SEMINAR IN POLITICAL SCIENCE OR CRIMINAL JUSTICE**

*1.00 to 4.00 Credits*

Can be repeated as topic varies.

### **498 - INDEPENDENT STUDY IN POLITICAL SCIENCE, CRIMINAL JUSTICE OR INTERNATIONAL STUDIES**

*1.00 to 4.00 Credits*

Approval of department chairman required prior to registration.

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# DEPARTMENT OF HUMAN PERFORMANCE AND SPORT SCIENCES

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Associate Professors Campoli, Glon, Keller, Swanson; Assistant Professors Beaschler (*Chair*), Coleman, Durand, Hofman, Kaczkowski, Wilson, Witte; Instructors Alborn, Nickerson, Rasic, Ridenour, Simmons, Terrell; Lecturers Cole, Hairston, Hunt, Ponx

## Mission Statement

The department of human performance and sport sciences prepares professionals for teaching, service, research, and/or leadership roles in educational institutions, business and industry, and other agencies. We strive to create an environment, which offers a unique opportunity to provide diverse, comprehensive, and life-long learning, while encouraging an appreciation of the importance of health, fitness and sport and their contribution to quality of life.

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

Physical Education (pre K-12)	70-72 hours
Health Education (pre K-12)	53 hours
Athletic Training	78 hours
Sport Management	77 hours
Exercise Physiology	76-78 hours

The department provides majors an opportunity to acquire a business option (28 hours).

The department provides courses of study leading to endorsement in the following area:

Athletic Coaching Certification - by Ohio Northern University 22-25 hours

***For specific information concerning these areas, please contact the human performance and sport sciences department chairperson.***

## Physical Education Service Courses

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

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

## Wellness Area:

Wellness Lab  
Weight Control and Nutrition

## Fitness Area:

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

## Lifetime Activities Area:

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

## Special Equipment or Fee Requirements for HPSS Department Courses

*AHPE activity class special equipment/fee requirements:*

Tennis—tennis balls and racquet  
Golf—clubs (when possible)  
Intermediate Fitness—bicycle  
Racquetball—racquet, racquetballs, protective goggles  
Canoeing and Whitewater Rafting—fee required  
Bowling—fee required  
Billiards—fee required  
Snow Skiing—fee required  
Hiking and Backpacking—fee required

*HPSS class special equipment/fee requirements:*  
First Aid-Responding to Emergencies—fee required  
Community CPR—fee required  
CPR for the Professional Rescuer—fee required  
Lifeguarding—pocket mask and fee required  
Water Safety Instruction—fee required

## Majors in Human Performance and Sport Sciences

### Special Requirements for Majors

1. All required courses and electives in the curricula of the student's major must be completed with a grade of "C" or better to satisfy graduation requirements.

2. In coaching theory course requirements, only one officiating course may apply.
3. Physical education majors are exempt from the three-hour service class requirement, but all other department majors must comply with this requirement.
4. Majors desiring teacher licensure must complete requirements of the Center for Teacher Education.
5. Students desiring to major in athletic training must be admitted to the certification tract of the athletic training program following a first-year competitive admissions process. Students must meet specific academic and technical standards prior to admittance. Specific requirements for admission may be obtained from the department of human performance and sport sciences or the athletic training education program director.
6. All students with a major in the HPSS department must fulfill a computer proficiency requirement (TECH-139, ABUS-201 or EDUC-320) in order to graduate.

*NOTE:* numbers in ( ) indicate credit hours

**Physical Education (pre K-12) 70-72 hours**

HPES XXX	Aquatics course (1-3)
HPES 112	First Aid (2)
HPES 113	Community CPR (1)
HPES 147	Basic Movement (2)
HPES 151	HPES Foundations (4)
HPES 212	Dance Majors (2)
HPES 213	Team, Individual & Dual Sports (4)
HPES 221	Exercise Physio. (4)
HPES 223	Kinesiology (4)
HPES 226	Care & Prevention of Ath. Inj. (4)
HPES 233	Elem. School Phys. Ed. (4)
HPES 271	Motor Learning (4)
HPES 303	Org. & Admin. (4)
HPES 304	Teach Tech. (1)
HPES 305	Teach Tech. (1)
HPES 324	Psych. of Coaching (2)
HPES 360	Test Meas. HPE (4)
HPES 402	Adapt. & Corr. PE (4)
HPES XXX	Coaching Techniques (6) (Only one officiating course may apply)

**Biology Courses**

BIOL 231	Anat. & Physio. 1 (4)
BIOL 232	Anat. & Physio. 2 (4)

**Education Courses**

EDUC 461	Integrated PE Methods (4)
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**Health Education (pre K-12) 53 hours**

HPES 099	Wellness Lab (1)
HPES 110	Intro to Exercise, Nutrition and Health (4)
HPES 111	Pers. Hlth Prob (4)
HPES 112	First Aid (2)
HPES 113	Community CPR (1)
HPES 119	Sch. & Comm. Hlth. (3)
HPES 151	HPES Foundations (4)
HPES 221	Exercise Physio. (4)
HPES 303	Org. & Admin. (4)

HPES 360	Test Meas. HPE (4)
HPES 402	Adapt. & Corr. PE (4)
HPES 494	Health Seminar (3)

**Biology Courses**

BIOL 231	Anat. & Physio. 1 (4)
BIOL 232	Anat. & Physio. 2 (4)

**Education Courses**

EDUC 460	Integrated Health Methods (4)
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**Pharmacy Courses**

PHBS 350	Nutrition (3)
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**Exercise Physiology (Formerly Wellness)**

*76-78 hours*

**Core Exercise Physiology Classes**

HPES 110	Introduction to Exercise, Nutrition and Health (4)
HPES 112	First Aid (2)
HPES 113	Community CPR (1)
HPES 207	Advanced Strength and Conditioning (3)
HPES 209	Sports Nutrition and Supplementation (4)
HPES 221	Exercise Physiology (4)
HPES 223	Kinesiology (4)
HPES 236	Biomechanics( 4)
HPES 261	Exercise/Fitness Testing and Prescription 1 (4)
HPES 262	Exercise/Fitness Testing and Prescription 2 (4)
HPES 337	Exercise Biochemistry (4)
HPES 375	Research Design and Statistics (4)
HPES 381	ECG Analysis (2)
HPES 3XX	Practicums (2)

**Clinical/Research Concentration Classes**

BIOL 124/126	Anatomy and Histology (4)
BIOL 302	Human Anatomy (4)
HPES 329	Exercise Pharmacology (4)
HPES 441	Introduction to Pathophysiology (4)
HPES 485	Wellness and Health Promotion Internship (16)

**Corporate Fitness/Personal Training Concentration Classes**

HPES 247	Sport Marketing and Promotions (4)
HPES 338	Exercise Programming for Selected Populations (2)
HPES 355	Organization and Administration of Health Promotion Programs/ Facilities Management(4)
HPES 362	Personal Training 1 (2)
HPES 363	Personal Training 2 (2)
HPES 485	Wellness and Health Promotion Internship (16)

<b>Exercise Physiology Minor 31 hours</b>	
HPES 207	Advanced Strength and Conditioning (3)
HPES 209	Sports Nutrition and Supplementation (4)
HPES 221	Exercise Physiology (4)
HPES 223	Kinesiology (4)
HPES 261	Exercise/Fitness Testing and Prescription 1 (4)
HPES 262	Exercise/Fitness Testing and Prescription 2 (4)

**AND**

*Any Two (2) of the Following Courses:*

HPES 110	Intro to Exercise, Nutrition and Health (4)
BIOL 302	Human Anatomy (4)
HPES 362	Personal Training 1 (2) <b>AND</b>
HPES 363	Personal Training 2 (2)

**Athletic Training 78 hours**

Students must be accepted into the athletic training program through a competitive admissions process. The formal admittance process occurs only one time per year beginning in the fall quarter and concluding during the spring quarter. A student desiring to transfer from another college or university must follow the university procedures outlined in the course catalog. Specific athletic training courses may receive transfer credit, but will only be accepted for graduation if there is documented evidence from the transfer institution that it includes the same educational competencies as the course(s) it is replacing. Specific requirements may be obtained from the department of human performance and sport sciences or the athletic training education program director.

HPES 111	Pers. Hlth. Prob. (4)
HPES 112	First Aid (2)
HPES 117	CPR for the Prof. Rescuer (1)
HPES 120	Adv. Wt. Control & Sport Nut. (2)
HPES 160	Basic Ath. Train. (4)
HPES 207	Adv. Strength & Conditioning (3)
HPES 215	Intro. to Eval. Tech. of Ath. Trng. (2)
HPES 221	Exer. Physio. (4)
HPES 223	Kinesiology (4)
BIOL 231	Ant. & Physio. 1 (4)
BIOL 232	Ant. & Physio. 2 (4)
HPES 251	AT Clinical Lev. 1 (1)
HPES 252	AT Clinical Lev. 2 (1)
HPES 275	Eval. Tech. in A.T. 1 (4)
HPES 276	Eval. Tech. in A.T. 2 (4)
HPES 284	Ath. Taping & Bracing (1)
HPES 353	AT Clinical Lev. 3 (1)
HPES 354	AT Clinical Lev. 4 (1)
HPES 371	Ther. Modalities in A.T. (4)
HPES 372	Exer. Rehab in A.T. 1 (4)
HPES 373	Exer. Rehab in A.T. 2 (4)
HPES 378	Psych. Factors of A.T. (2)

HPES 441	Intro. to Pathophysiology (4)
HPES 455	AT Clinical Lev. 5 (1)
HPES 456	AT Clinical Lev. 6 (1)
HPES 461	Medical Considerations (3) (offered even years)
HPES 493	Senior Seminar (4)
HPES 495	Trends in A.T. (4) (offered odd years)

**Sport Management Major 77 hours**

HPES 153	Intro. Sprt. Mgm. (4)
HPES 247	Sprt. Market/Promo (4)
HPES 256	Soc/Psych of Sport (4)
HPES 303	Org. & Adm. (4)
HPES 344, 345, 346	Practicum (1) (Must take one)
HPES 410	Ethics in Sport (4)
HPES 421	Sport Law (4)
HPES 486	Sprt. Mgm. Intern (15)
HPES 496	Sprt. Mgm. Seminar (1)

**Communication Arts Courses**

COMM 130	Intro. Pub. Rel. (4)
COMM 211	Public Speaking (4)
COMM 212	Business and Prof. Spkg. (4)
COMM 236	Public Relations Writ. (4)
<b>Business Administration Courses</b>	
IBEC 100	Economics (4)
ACCT 211	Prin. of Accounting 1 (4)
ABUS 312	Business Law 1 (4)
MGMT 325	Employment Law (4)
MGMT 333	Mgmt. & Org. Beh. (4)

Majors in the HPSS department may select the College of Arts and Sciences **Business Option** by successful completion of the following option requirements and electives:

ACCT 211	Prin. of Accounting 1 (4)
ACCT 212	Prin. of Accounting 2 (4)
ABUS 312	Business Law 1 (4)
MGMT 325	Employment Law (4)
MGMT 333	Mgmt. & Org. Beh. (4)
MGMT 363	Human Resource Management (4)
MRKT 351	Prin. of Marketing (4)

In addition to the College of Arts and Sciences Business Option, the following **certification** is available from the department.

**ONU Coaching Certification 22-25 hours**

HPES 112	First Aid (2)
HPES 113	Community CPR (1)
HPES 226	Care & Prevention of Ath. Inj. (4)
HPES 256	Soc/Psych of Sport (4)
HPES 303	Org. & Admin. (4)
HPES 324	Psych. of Coaching (2)
HPES 334	Adv. Coach. (1-4)

Two coaching theory courses (only one officiating course may apply)

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

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**All AHPE courses graded S/U**

**001 - VARSITY FOOTBALL PARTICIPATION**

*1.00 Credit*

**002 - VARSITY CROSS COUNTRY  
PARTICIPATION (MEN)**

*1.00 Credit*

**003 - VARSITY SOCCER PARTICIPATION (MEN)**

*1.00 Credit*

**004 - VARSITY VOLLEYBALL PARTICIPATION**

*1.00 Credit*

**005 - VARSITY BASKETBALL PARTICIPATION (MEN)**

*1.00 Credit*

**006 - VARSITY BASKETBALL PARTICIPATION  
(WOMEN)**

*1.00 Credit*

**007 - VARSITY CROSS COUNTRY  
PARTICIPATION (WOMEN)**

*1.00 Credit*

**008 - VARSITY SOCCER PARTICIPATION (WOMEN)**

*1.00 Credit*

**010 - VARSITY TRACK PARTICIPATION  
(WOMEN)**

*1.00 Credit*

**011 - VARSITY WRESTLING PARTICIPATION**

*1.00 Credit*

**012 - VARSITY TRACK PARTICIPATION (MEN)**

*1.00 Credit*

**013 - VARSITY TENNIS PARTICIPATION (MEN)**

*1.00 Credit*

**014 - VARSITY TENNIS PARTICIPATION  
(WOMEN)**

*1.00 Credit*

**015 - VARSITY GOLF PARTICIPATION (MEN)**

*1.00 Credit*

**016 - VARSITY SOFTBALL PARTICIPATION**

*1.00 Credit*

**017 - VARSITY BASEBALL PARTICIPATION**

*1.00 Credit*

**018 - VARSITY SWIMMING PARTICIPATION  
(MEN AND WOMEN)**

*1.00 Credit*

**019 - VARSITY GOLF PARTICIPATION (WOMEN)**

*1.00 Credit*

**021 - WEIGHT TRAINING AND PHYSICAL  
CONDITIONING**

*1.00 Credit*

Provide knowledge and skills in various types of weight training and conditioning activities. To provide a knowledge of the Nautilus and Universal equipment. To promote better fitness through weight training activity and exercise. (Fitness)

**024 - BEGINNERS GOLF**

*1.00 Credit*

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

**029 - RACQUETBALL**

*1.00 Credit*

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

**030 - BEGINNERS SWIMMING**

*1.00 Credit*

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

**033 - INTERMEDIATE SWIMMING**

*1.00 Credit*

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

**034 - BOWLING**

*1.00 Credit*

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

### **036 - BEGINNING FITNESS**

#### *1.00 Credit*

Development of an individualized low intensity fitness program which best fits the physical and mental needs of each student. Programs will be formulated and monitored by the students and instructor. Activities include aerobic exercise and cardiovascular conditioning. (Fitness)

### **037 - INTERMEDIATE FITNESS**

#### *1.00 Credit*

An individualized medium intensity fitness program which best fits the physical and mental needs of each student. Programs will be formulated and monitored by the students and instructor. Activities could include cycling, hydrosports (fitness swimming), running and power walking. (Fitness)

### **038 - ADVANCED FITNESS**

#### *1.00 Credit*

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

### **040 - BILLIARDS**

#### *1.00 Credit*

To offer each student the opportunity to learn and participate in the fundamentals of billiards. (Lifetime Activities)

### **042 - HIKING AND BACKPACKING**

#### *1.00 Credit*

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

### **045 - RHYTHMIC FUNDAMENTALS**

#### *1.00 Credit*

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

### **047 - SAILING AND SEAMANSHIP**

#### *1.00 Credit*

The course is taught mostly in the classroom, and lessons in safe boating are included. (Lifetime Activities)

### **049 - SNOW SKIING**

#### *1.00 Credit*

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

### **050 - SOCIAL DANCE**

#### *1.00 Credit*

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

### **052 - CANOEING AND WHITE WATER RAFTING**

#### *1.00 Credit*

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

### **060 - ARCHERY**

#### *1.00 Credit*

The scope and extent of archery, selection of equipment, safety, bracing of the bow, methods of shooting, points of aim, scoring, correction of problems. (Lifetime Activities)

### **065 - AQUATIC EXERCISE**

#### *1.00 Credit*

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

### **066 - DANCE AEROBICS**

#### *1.00 Credit*

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

## **070 - SELF DEFENSE**

### *1.00 Credit*

Self defense maneuvers will enable the student to gain proficiency with fundamental punches, kicks, blocks and counters. An important part of this class is to create an awareness and an appreciation for self defense. (Lifetime Activities)

## **078 - BADMINTON**

### *1.00 Credit*

The game of badminton, knowledge of the rules, history, scoring, and strategies of both singles and doubles play will be emphasized. (Lifetime Activities)

## **080 - BEGINNING TENNIS**

### *1.00 Credit*

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

## **083 - SQUARE AND FOLK DANCE**

### *1.00 Credit*

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

## **086 - VOLLEYBALL**

### *1.00 Credit*

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

## **087 - AEROBIC ACTIVITIES**

### *1.00 Credit*

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

## **088 - WEIGHT CONTROL AND NUTRITION**

### *1.00 Credit*

Basic nutrition and methods of healthy weight loss which could include prescribed activity. (Wellness)

## **090 - SPECIAL TOPICS IN HUMAN PERFORMANCE AND SPORT SCIENCES**

### *1.00 to 4.00 Credits*

May be repeated for credit as topic varies.

## **099 - WELLNESS LAB**

### *1.00 Credit*

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

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## **Subject - Human Performance & Sport Sciences (HPES)**

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## **000 - ORIENTATION-HEALTH, PHYSICAL EDUCATION, SPORT STUDIES**

### *1.00 Credit*

Introduction to the professions of Health, Physical Education, Sport Management, Athletic Training and Exercise Physiology. Graded S/U.

## **101 - WELLNESS ORIENTATION AND OBSERVATION**

### *1.00 Credit*

A minimum of 45 clock hours of experience or observation in an organization, corporation, hospital or agency fitness or health promotion program. Graded S/U.

## **110 - INTRODUCTION TO EXERCISE, NUTRITION AND HEALTH**

### *4.00 Credits*

Basic concepts and components of health and fitness related topics such as physical activity, disease, nutrition and body composition. Application and assessment of selected physiological and fitness parameters and how these topics can be used to promote a healthy, active lifestyle. Permission of department chairperson required for non-HPSS majors.

## **111 - PERSONAL HEALTH**

### *4.00 Credits*

A theoretical and practical treatment of the concepts of disease prevention and health promotion. Course content includes topics such as emotional health; aging and death; alcohol, tobacco, and drug abuse; physical fitness; nutrition and dieting; consumer health; chronic and communicable diseases; human sexuality; and stress management.

## **112 - FIRST AID-RESPONDING TO EMERGENCIES**

### *2.00 Credits*

Lectures, discussion and practice in the giving of first aid in emergencies. The American Red Cross Certification may be obtained by students who pass an examination. Course can be taken only once for graduation credit. Course may be repeated an unlimited number of times for card renewal as space permits. (Fee)

## **113 - COMMUNITY CPR**

### *1.00 Credit*

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

## **114 - LIFEGUARDING**

### *2.00 Credits*

To develop knowledge and skills to aid in the prevention of aquatic accidents and an ability to give assistance to victims. The American Red Cross Advanced Lifeguarding certificate/emblem may be obtained by passing an examination. Prerequisite: Instructor approval. (Fee)

## **115 - WATER SAFETY INSTRUCTION**

### *3.00 Credits*

Teaching of swimming and water safety skills, methods and techniques. Successful completion of the course will lead to American Red Cross Water Safety Instruction certification. Meets 4 days per week. Prerequisite: Current certification in advanced lifeguarding. (Fee)

## **117 - CPR FOR THE PROFESSIONAL RESCUER**

### *1.00 Credit*

Skills in Community CPR with additional emphasis in advanced assessment and care including the use of AED's, oxygen administration, water rescue, stabilization and transportation and special resuscitation techniques. American Red Cross certification may be obtained by students who pass an examination. Course can be taken only once for graduation credit. Course may be repeated an unlimited number of times for card renewal as space permits. (Fee)

## **119 - SCHOOL AND COMMUNITY HEALTH**

### *3.00 Credits*

Skills and knowledge for aiding teachers and wellness staff to observe and understand the target population in health and illness; the health program of the public schools and the relationship of the school to the students' habits, attitudes and knowledge conducive to good health. Health matters with focus on health problems amenable to community action.

## **120 - ADVANCED WEIGHT CONTROL AND SPORTS NUTRITION**

### *2.00 Credits*

The nutritional requirements for athletes and the physically active population. Analyze principles of weight control, including body fat, caloric requirements, effects of exercise and fluid loss/replacement. Recognize disordered eating habits and illnesses associated with poor nutritional habits and implement proper referral procedures.

## **147 - BASIC MOVEMENT - MAJORS**

### *2.00 Credits*

The principles and laws of motion as applied to basic human movement and performance. An introduction to the basic locomotor and axial movements possible in the human body and the utilization of these basic movements as they are combined in the efficient performance of complex tasks. Offered even numbered years.

## **151 - HPE/SPORT STUDIES FOUNDATIONS**

### *4.00 Credits*

Introduction to five foundation areas - the historical, philosophical, psychological, physiological and sociological - of physical education, health education, and sport studies. A sixth unit treats scope, justification and needs of the profession and professional opportunities.

## **153 - INTRODUCTION TO SPORT MANAGEMENT**

### *4.00 Credits*

Initial professional experience and preparation to pursue the sport management curriculum with enhanced understanding and insight. The basic concepts in sport management; career preparation, professional opportunities and professional skills. Prerequisite: Sport Management major only or with permission of department chairperson.

## **160 - BASIC ATHLETIC TRAINING**

### *4.00 Credits*

The prevention, recognition and care of athletic injuries as well as common principles associated with the athletic training profession. For athletic training majors only. Credit cannot be given for both HPES 160 and HPES 226. (Formerly HPES 243).

## **190 - SPECIAL TOPICS IN HUMAN PERFORMANCE AND SPORT SCIENCES**

### *1.00 to 4.00 Credits*

May be repeated for credit as topic varies.

## **201 - AIDS AND OTHER SEXUALLY TRANSMITTED DISEASES**

### *3.00 Credits*

An introductory, non-technical examination of the biological/medical, social, psychological, and other ethical aspects of AIDS and other sexually transmitted diseases. Topics include but are not limited to: history of STD's, types, treatment, and prevention of STDs; medical aspects of HIV/AIDS; counseling of AIDS/HIV virus individuals; HIV testing; AIDS education in school systems; religion and AIDS/HIV; minorities/women and AIDS; legal aspects and ethical issues of AIDS/HIV; life with AIDS/HIV (presentation by HIV positive individuals and family members of persons with AIDS).



## **207 - ADVANCED STRENGTH AND CONDITIONING**

### *3.00 Credits*

Addresses physiological response to exercise, proper and safe methods and techniques of strength training, testing of strength and conditioning, interpreting testing data, and developing proper strength and conditioning programs for various individuals and groups. Prerequisite: BIOL 231.

## **209 - SPORTS NUTRITION AND SUPPLEMENTATION**

### *4.00 Credits*

Macro and Micro-nutrient aspects of exercise training and an overview of sports supplementation. An in-depth examination of how nutrition and diet alter athletic performance. An in-depth examination of how nutrition, sports supplementation and ergogenic aids alter athletic performance. Topics include high carbohydrate and fat diets, muscle glycogen loading, creatine supplementation, protein and amino acid supplementation, vitamin and mineral supplementation, steroid use and other ergogenic substances. Prerequisite: HPES 221.

## **212 - DANCE - MAJORS**

### *2.00 Credits*

The skills and methods of teaching various areas of the dance; folk, square and social dance and rhythmic fundamentals. Offered even numbered years.

## **213 - TEAM, INDIVIDUAL AND DUAL SPORTS**

### *4.00 Credits*

The fundamental skills, methods and techniques in teaching the following activities: tennis, badminton, archery, golf, weight lifting, bowling, track and field, basketball, softball, recreational games, speedball, soccer, various versions of touch football, field hockey and volleyball.

## **215 - INTRODUCTION TO EVALUATION TECHNIQUES IN ATHLETIC TRAINING**

### *2.00 Credits*

Overview of the injury evaluation process to include appropriate use of medical terminology and SOAP writing. Laboratory experiences in anatomic palpation, goniometry and manual muscle testing. Prerequisite: Athletic training majors only.

## **221 - EXERCISE PHYSIOLOGY**

### *4.00 Credits*

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

## **223 - KINESIOLOGY**

### *4.00 Credits*

General body mechanics of the human organism; the activities of the physical education program in their relation to coordination and the proper body mechanics, analysis of movement. Prerequisite: BIOL 231.

## **226 - CARE AND PREVENTION OF ATHLETIC INJURIES**

### *4.00 Credits*

Complete body examination focusing on the initial care and prevention of athletic injuries. Common risk factors and mechanism of athletic injuries will also be identified. Laboratory designed to familiarize the student with taping techniques. Credit cannot be given for both HPES 160 and HPES 226. (Formerly HPES 243).

## **233 - PHYSICAL EDUCATION FOR THE ELEMENTARY SCHOOL**

### *4.00 Credits*

The aims, objectives, methods, and techniques of teaching physical education in the elementary school. The need for physical activity and practical application of theories are emphasized. Prerequisite: sophomore standing.

## **236 - BIOMECHANICS**

### *4.00 Credits*

Basic biomechanical properties between the body and the physical world. Integration of the qualitative description of movements (linear and angular) with the forces associated with static and dynamic systems in the body. Topics include the stresses, forces and loads as applied to cartilage, muscle, tendons and bones. Prerequisite: HPES 223.

## **247 - SPORT MARKETING AND PROMOTIONS**

### *4.00 Credits*

The practice of marketing, promotions and sales in the sport marketplace. Introduction to event management, print and broadcast media advertising, marketing strategies, and a class project. Open to sport management majors and others with approval of the department chairperson. Prerequisites: HPES 153 and sophomore status.

## **251 - ATHLETIC TRAINING CLINICAL LEVEL 1**

### *1.00 Credit*

Involvement in on-campus clinical sport rotation as assigned by the athletic training staff. Under the supervision of an approved clinical instructor, specific clinical proficiencies will be completed. Prerequisites: HPES 112, HPES 160, admission to the certification track of the athletic training major, and must be in good academic standing. Graded S/U. (Formerly HPES 280)

## **252 - ATHLETIC TRAINING CLINICAL LEVEL 2**

### *1.00 Credit*

Involvement in on-campus clinical sport rotation as assigned by the athletic training staff. Under the supervision of an approved clinical instructor, specific clinical proficiencies will be completed. Prerequisites: HPES 251 and must be in good academic standing. Graded S/U.

## **256 - SOCIOLOGY/PSYCHOLOGY OF SPORT**

### *4.00 Credits*

Significance of sports in society; examination of the relationships between social institutions and how these relationships shape the mental characteristics of those involved in sports; how sports contribute to human welfare in advanced technological societies. Prerequisite: HPES 153 and sophomore status.

## **261 - EXERCISE/FITNESS TESTING AND PRESCRIPTION 1**

### *4.00 Credits*

The concepts and principles of testing and evaluating fitness levels and the application of those results for the purpose of designing individual exercise prescriptions. Prerequisites: HPES 110 and BIOL 231

## **262 - EXERCISE/FITNESS TESTING AND PRESCRIPTION 2**

### *4.00 Credits*

Measurement and evaluation of basic physiological components of exercise and fitness. The assessment and interpretation of physiological parameters associated with fitness and the application of these results to exercise training and prescription. Prerequisites: HPES 261 and HPSS major or permission of the department chairperson.

## **271 - MOTOR LEARNING**

### *4.00 Credits*

Provides the future physical educator with opportunities to acquire practical knowledge of the processes and variables that influence the rate, level, and retention of skill acquisition. The student will ultimately be able to develop a sound theoretical basis for instruction, coaching and performance enhancement.

## **275 - EVALUATION TECHNIQUES IN ATHLETIC TRAINING 1**

### *4.00 Credits*

The practical application of the injury evaluation process, incorporating origins, insertions, and innervations of selected muscle groups and manual muscle testing of the upper body, including the head and cervical spine. Also prepares students to make assessments of injuries, and formulate written injury evaluations and SOAP notes for documentation purposes. Prerequisites: BIOL 231 and HPES 215.

## **276 - EVALUATION TECHNIQUES IN ATHLETIC TRAINING 2**

### *4.00 Credits*

Continuation of HPES 275, but focusing on the lower body, with an in-depth look at postural abnormalities and gait analysis. Prerequisites: HPES 251 and 275.

## **284 - ATHLETIC TAPING AND BRACING**

### *1.00 Credit*

Principles and techniques associated with specialized taping, wrapping, bracing and padding selected joints and body parts. Additional focus on legal concepts regulating design, application, construction, maintenance and reconditioning of immobilization devices. Prerequisite: Must be admitted to the certification tract of the athletic training major. Graded S/U.

## **290 - SPECIAL TOPICS IN HUMAN PERFORMANCE AND SPORT SCIENCES**

### *1.00 to 4.00 Credits*

May be repeated for credit as topic varies.

## **300 - HEALTH PROMOTION PRACTICUM**

### *3.00 Credits*

An on campus experience designed to provide practical experience as a health promotion professional under the direct supervision of departmental staff. Experiences will be in the University Wellness and Exercise Program. Prerequisites: AHPE 099; HPES 110, 112, 226 and 261. Permission of department chairperson required.

## **303 - ORGANIZATION AND ADMINISTRATION OF HEALTH, PHYSICAL EDUCATION, AND SPORT STUDIES**

### *4.00 Credits*

Examination of the philosophy, principles, problems, policies and procedures essential in the organization and administration of meaningful programs in health education, physical education, and sports studies. Prerequisite: HPSS majors only and junior status.

## **304 - PRACTICAL TECHNIQUES OF TEACHING PHYSICAL EDUCATION 1**

### *1.00 Credit*

Required of all physical education majors, preferably in their junior year. Involves assisting in service classes. Permission of department chairperson required.

## **305 - PRACTICAL TECHNIQUES OF TEACHING PHYSICAL EDUCATION 2**

### *1.00 Credit*

Continuation of HPES 304. Prerequisites: HPES 304 and permission of the department chairperson.

## **306 - PRACTICAL TECHNIQUES OF TEACHING PHYSICAL EDUCATION 3**

### *1.00 Credit*

Continuation of HPES 304,305. Prerequisites: HPES 304 and 305, and permission of department chairperson required.

### **308 - TECHNIQUES-COACHING VOLLEYBALL**

#### *2.00 Credits*

Develops a basic expertise in the techniques and knowledge of coaching volleyball. Provides laboratory experiences in the practical application of techniques and knowledge of coaching volleyball. Upon successful completion of course requirements and instructor's recommendation, participants may receive USVBA Level I certification. Volleyball playing or coaching experience required. Offered odd numbered years.

### **310 - TECHNIQUES-COACHING SOFTBALL**

#### *2.00 Credits*

Develops a basic expertise in the knowledge and techniques of coaching softball. Provides laboratory experiences in the practical application of techniques and knowledge of coaching softball. Emphasis is on fast pitch. Offered even numbered years.

### **315 - OFFICIATING-VOLLEYBALL**

#### *2.00 Credits*

Knowledge and techniques of officiating volleyball. USA and NCAA rules. Laboratory experiences during class and intramural volleyball. Offered even numbered years. USA certification available upon successful completion of course.

### **317 - THEORY OF TRACK AND FIELD OFFICIATING**

#### *2.00 Credits*

Knowledge and techniques of officiating track and field. National Federation rules. Laboratory experiences during varsity track and field. Offered odd numbered years.

### **319 - THEORY AND METHOD OF COACHING TRACK**

#### *2.00 Credits*

Methods and forms for all of the events in track and field. Lectures, reports, demonstrations and practice. Offered even numbered years.

### **320 - THEORY OF COACHING AND OFFICIATING WRESTLING**

#### *2.00 Credits*

Equipment, fundamentals of the art and skill of wrestling. Offered even numbered years.

### **321 - THEORY OF FOOTBALL COACHING**

#### *2.00 Credits*

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

### **322 - THEORY OF COACHING BASKETBALL**

#### *2.00 Credits*

The fundamentals: passing, shooting, dribbling, feinting and pivoting, styles of offense and defense, equipment, conditioning, the handling of a team in games. Lectures, demonstrations and practice. Prerequisite: Junior status or permission of department chairperson.

### **323 - THEORY OF COACHING BASEBALL**

#### *2.00 Credits*

Individual position and team play in baseball. Lectures, reports, demonstration, and practice.

### **324 - PSYCHOLOGY OF COACHING**

#### *2.00 Credits*

The cultural, emotional, psychological and sociological aspects of coaching. Player-coach relationship, understanding the athlete, improving coaching effectiveness. HPSS majors only.

### **327 - THEORY OF COACHING SOCCER**

#### *2.00 Credits*

Equipment, fundamentals of the game: kicking, passing, playing the ball, strategy and generalship. Offered on demand.

### **329 - EXERCISE PHARMACOLOGY**

#### *4.00 Credits*

Influence of commonly used drugs and medicinal supplements on exercise performance and exercise prescription in patients and athletes. Substances examined include over-the-counter, prescription and social drugs, as well as natural substances. Agents covered include hormonal, cardiopulmonary, metabolic and social drugs, and naturally-derived medicinal substances. Prerequisites: Junior status and HPES 221.

### **334 - ADVANCED COACHING INTERNSHIP-EXTERNSHIP**

#### *1.00 to 4.00 Credits*

Coaching under supervision in any sport in season. Hours arranged. May be repeated but only six credit hours will count toward graduation. Prerequisite: Permission of department chairperson.

### **337 - EXERCISE BIOCHEMISTRY**

#### *4.00 Credits*

Bioenergetics of energy production during exercise in skeletal muscle, liver and adipose tissue. The major biochemical pathways, enzymes and intermediates associated with carbohydrate, fat, and protein utilization during exercise. Topics relevant to anabolism and catabolism during exercise including glycolysis, cellular metabolism, glycogen synthesis gluconeogenesis, lipolysis, and amino acid and protein synthesis. The effects of exercise training on fuel utilization. Prerequisites: HPES 209 and 221.

### **338 - EXERCISE PROGRAMMING FOR SELECTED POPULATIONS**

#### *4.00 Credits*

Exercise programming, development and implementation for selected populations. Selected populations include children, adolescents, older adults, pregnant women and corporate clients. The rehabilitation programming for individuals with cardiac, vascular and pulmonary diseases. Prerequisites: HPES 362 and 363.

### **342 - BASKETBALL OFFICIATING**

#### *2.00 Credits*

Basketball rules and mechanics from the standpoint of player, coach and official. Not for certification. Arrangements can be made if certification is desired. Basketball playing or coaching experience required.

### **344 - SPORT MANAGEMENT PRACTICUM-TEAM PROMOTIONS**

#### *1.00 Credit*

Designed to give Sport Management majors the opportunity to acquire promotional experience through involvement with a sport team at the University. Can be taken only once for graduation credit. Can be repeated an unlimited number of times as space permits. Prerequisite: Junior status and permission of department chairperson.

### **345 - SPORT MANAGEMENT PRACTICUM-FACILITIES MANAGEMENT**

#### *1.00 Credit*

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

### **346 - SPORT MANAGEMENT PRACTICUM-TEAM MANAGEMENT**

#### *1.00 Credit*

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

### **353 - ATHLETIC TRAINING CLINICAL LEVEL 3**

#### *1.00 Credit*

Involvement in on-campus clinical sport rotation as assigned by the athletic training staff. Under the supervision of an approved clinical instructor, specific clinical proficiencies will be completed. Prerequisites: HPES 252 and 276, and must be in good academic standing. Graded S/U.

### **354 - ATHLETIC TRAINING CLINICAL LEVEL 4**

#### *1.00 Credit*

Involvement in on-campus sport rotation or off-campus clinic site as assigned by the athletic

training staff. Under the supervision of an approved clinical instructor, specific clinical proficiencies will be completed. Prerequisites: HPES 353 and 371, and must be in good academic standing. Graded S/U.

### **355 - ORGANIZATION & ADMINISTRATION OF HEALTH PROMOTION PROGRAMS**

#### *4.00 Credits*

A study of the design implementation, organization, administration and evaluation of health promotion programs; consists of competencies and strategies in administrative tasks, programming, facilities, equipment, marketing, sales, finance and liability. Prerequisite: Junior status.

### **360 - TESTS AND MEASUREMENTS OF HEALTH AND PHYSICAL EDUCATION**

#### *4.00 Credits*

Fundamental considerations of measurement; physical education and health measurements; test evaluation; criteria of tests; validity of tests; accuracy of tests; physical fitness; skills tests; application of measurement; elements of statistics. HPSS majors only.

### **362 - PERSONAL TRAINING 1**

#### *2.00 Credits*

Design and implementation of personal training programs to increase aerobic conditioning and endurance. Prerequisite: HPES 262.

### **363 - PERSONAL TRAINING 2**

#### *2.00 Credits*

Design and implementation of personal training programs to increase muscular strength and power. Prerequisite: HPES 362.

### **365 - ATHLETICS TESTING PRACTICUM**

#### *1.00 Credit*

The collection and interpretation of physiological data associated with the training of athletes under the direct supervision of departmental staff. Various athletic populations will be tested for physiological parameters such as aerobic and anaerobic capacities, strength, power, and metabolism. Testing of a variety of athletic teams at Ohio Northern University, providing the opportunity to gain practical athletics testing experience with the athletics populations of the student's choice. Prerequisites: Wellness major, exercise physiology, junior status, HPES 261 or permission of the department chairperson.

### **367 - BODY COMPOSITION PRACTICUM**

#### *1.00 Credit*

The collection and interpretation of physiological data associated with body composition under the direct supervision of departmental staff. Body composition as determined by skinfold measurement, hydrostatic weighing, and bio-electrical impedance. Prerequisites: Wellness major, exercise physiology major, junior status, HPES 261 or permission of department chairperson.

### **369 - HEALTH AND WELLNESS SCREENING PRACTICUM**

#### *1.00 Credit*

Organizing and conducting health and wellness screenings under the direct supervision of departmental staff. Experiences include health and fitness assessment of body composition, cardiorespiratory fitness, blood profiles and dietary analysis.

Prerequisites: Wellness major, exercise physiology major, sophomore status, HPES 110 or permission of the department chairperson.

### **371 - THERAPEUTIC MODALITIES IN ATHLETIC TRAINING**

#### *4.00 Credits*

Indications and contraindications of therapeutic modalities in the treatment of athletic injuries as they relate to the healing process. Prerequisites: HPES 221 and 276.

### **372 - EXERCISE REHABILITATION IN ATHLETIC TRAINING 1**

#### *4.00 Credits*

Basic components of a comprehensive rehabilitation program. Selection of therapeutic exercises for injuries/corrective surgeries sustained by the recreational athlete. Discussion will focus on the upper extremities. Prerequisite: HPES 371.

### **373 - EXERCISE REHABILITATION IN ATHLETIC TRAINING 2**

#### *4.00 Credits*

Continuation of HPES 372, but focusing on the lower extremities. Covers basic components of a comprehensive rehabilitation program. Prerequisite: HPES 372.

### **375 - RESEARCH DESIGN AND STATISTICS**

#### *4.00 Credits*

The design and analysis of basic research in the exercise physiology. Overview of experimental design, literature review, research methodology and statistical concepts and analysis. Prerequisite: Junior status.

### **378 - PSYCHOSOCIAL FACTORS IN ATHLETIC TRAINING**

#### *2.00 Credits*

The psychological and sociocultural factors relative to an athletic population as well as the roles and functions of various health care providers responsible for professional care. Strategies for identifying problems, intervening and making appropriate referrals are presented. Prerequisite: HPES 353.

### **381 - ECG ANALYSIS**

#### *2.00 Credits*

The cardiac muscle, electrocardiography, ECG analysis and interpretation in the normal and diseased state. The physiological basis of normal and abnormal ECG tracings as they relate to cardiac physiology. Prerequisites: HPES 221 and wellness and exercise physiology majors.

### **383 - ADULT FITNESS PROGRAM PRACTICUM**

#### *1.00 Credit*

Comprehensive practical experience working with an adult fitness program under the direct supervision of departmental staff. Practicum is conducted through Ohio Northern University Health and Wellness program. Experiences include client testing, counseling, monitoring, as well as fitness facility management.

Prerequisites: Wellness major, exercise physiology major, junior status, HPES 262 or permission of department chairperson.

### **390 - SPECIAL TOPICS IN HUMAN PERFORMANCE AND SPORT SCIENCES**

#### *1.00 to 4.00 Credits*

May be repeated for credit as topic varies.

### **402 - ADAPTIVE AND CORRECTIVE PHYSICAL EDUCATION**

#### *4.00 Credits*

For the professionals who are concerned with physical activities for people with disabilities; to develop an understanding of the various disabling conditions and to explore methods of adapting physical activities to meet the needs of the atypical student in the physical education class. Prerequisite: HPES 223.

### **410 - ETHICS IN SPORT**

#### *4.00 Credits*

Survey, interpretations, and evolution of past and present ethical concepts and value conflicts facing the sport profession. Discussion of ethical theories and issues that arise in sport situations and ways of resolving them.

Prerequisite: Junior status and HPSS majors only.

### **421 - SPORT LAW**

#### *4.00 Credits*

Develops an awareness of the complexities concerning sports litigation, primarily in the focus of educational institutions. To use this new knowledge to assist their professional growth in the field. To have a clear understanding of the Law and its fundamental elements. Prerequisites: Junior status, HPSS majors only, or permission of department chairperson.

### **441 - INTRODUCTION TO PATHOPHYSIOLOGY**

#### *4.00 Credits*

The physiology of abnormal and disease states. The functional and physiological changes that accompany a particular disease or syndrome. Major health-related disease states such as coronary heart disease, hypertension, diabetes, atherosclerosis and arteriosclerosis will be examined. Prerequisites: Junior status and HPES 337.

**455 - ATHLETIC TRAINING CLINICAL LEVEL 5**

*1.00 Credit*

Involvement in on-campus clinical sport rotation or off-campus site as assigned by the athletic training staff. Under the supervision of an approved clinical instructor, specific clinical proficiencies will be completed. Prerequisites: HPES 354 and 373 and must be in good academic standing. Graded S/U.

**456 - ATHLETIC TRAINING CLINICAL LEVEL 6**

*1.00 Credit*

Involvement in on-campus clinical sport rotation or off-campus clinic site as assigned by the athletic training staff. Under the supervision of an approved clinical instructor, specific clinical proficiencies will be completed. Prerequisite: HPES 455 and must be in good academic standing. (Formerly HPES 480)

**461 - MEDICAL CONSIDERATIONS IN ATHLETICS**

*3.00 Credits*

Etiology, recognition, evaluation, treatment and referral of general medical conditions and disabilities. Focus on assessment of body systems. Pharmacological applications relevant to treatment of injuries and illnesses common to athletes. Prerequisites: Junior status and HPES 252. Offered even numbered years.

**485 - WELLNESS AND HEALTH PROMOTION INTERNSHIP**

*4.00 to 16.00 Credits*

Participation in a broad based, off-campus experience designed for fitness development or health promotion program under the supervision of the University as well as a worksite supervisor. May be repeated but only 15 credit hours will count toward graduation. Prerequisites: Senior status; 2.00 GPA, 2.50 GPA in major; and permission of the department chairperson required.

**486 - SPORT MANAGEMENT INTERNSHIP**

*1.00 to 15.00 Credits*

Specially planned sport management work throughout the quarter to provide direct employment experience. Emphasis is on the practical application of theory and knowledge in developing professional skills. May be repeated but only 15 credit hours will count toward graduation. To be taken with the Sport Management Seminar to assist the students with the integration of fieldwork and classroom learning. Junior status and permission of department chairperson required.

**487 - HUMAN PERFORMANCE AND SPORT SCIENCES GENERAL INTERNSHIP**

*4.00 to 16.00 Credits*

Participation in a broad based, off-campus experience designed to accommodate students with a departmental major or multiple majors where discipline-specific or combined discipline internships are not offered. Prerequisites: senior status; 2.00 GPA; 2.50 GPA in majors; and permission of department chairperson. Course may be repeated but only 16 hours will count toward graduation.

**490 - SPECIAL TOPICS IN HUMAN PERFORMANCE AND SPORT SCIENCES**

*1.00 to 4.00 Credits*

May be repeated for credit as topic varies.

**493 - SENIOR SEMINAR IN ATHLETIC TRAINING**

*4.00 Credits*

Professional preparation for athletic training students taking the NATABOC exam. Review of athletic training domains, exam simulations, mock interviews and practical application of psychomotor skills will be emphasized. Prerequisite: HPES 455.

**494 - HEALTH SEMINAR**

*3.00 Credits*

An in-depth analysis of current health problems, issues and trends as they apply to the teacher of health education.

**495 - TRENDS IN ATHLETIC TRAINING**

*4.00 Credits*

Current topical issues affecting the Athletic Training Profession include organization and administration topics, legal issues, and selected health issues that are present in the athletic population. Prerequisites: Junior status and HPES 252. Offered odd numbered years.

**496 - SPORT MANAGEMENT SEMINAR**

*1.00 Credit*

Discussion and analysis of the field setting, practice and organization. Includes monitoring and evaluation of the internships. To be taken concurrently with Sport Management Internship.

**497 - INDEPENDENT STUDY IN HPSS**

*1.00 to 4.00 Credits*

An in-depth exploration of a subject of special interest. Can be repeated as topic varies. Prerequisite: junior status and written permission from the faculty-mentor, the department chairperson and the Dean of the College prior to registration. Junior or higher status required.

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# INSTITUTE FOR SOCIAL RESEARCH

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Professor J. Scott; Associate Professors Durkin (*Director*), Ewing, Iseman, Kauffman, D. Smith, Wilson; Assistant Professors Alexander, Moore, Shanahan

The Ohio Northern University's *Institute For Social Research* offers a unique opportunity for students in several of the undergraduate programs of the University. The Institute prepares surveys, needs assessments, policy research, and other social research tasks as required by public and private agencies in the region.

The research institute offers exceptional students with an opportunity to observe and participate in social, political, and geographic research and consulting services at increasing levels of responsibility as an important adjunct to their education in the Social Sciences.

ISR 186, 286, 386, 486 may count toward their primary or secondary major but only 4 credit hours will count for major and 12 credit hours will count toward degree.

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## Subject - Institute for Social Research (ISR)

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### 186 - SOCIAL RESEARCH PRACTICUM 1

1.00 Credit

Participation in the Institute for Social Research under the direction of a Research Fellow. Permission required. Graded S/U.

### 253 - RESEARCH METHODS 1

4.00 Credits

Major research techniques, including participant and non-participant observation, interview, questionnaire, use of available data, and experiment. Other topics include sampling and establishing causality in non-experimental research. Prerequisite: STAT 142 or equivalent. (Formerly listed as PLSC 253 and SOC 253)

### 254 - RESEARCH METHODS 2

4.00 Credits

Empirical concepts and tools for analyzing and explaining political and social phenomena. Hands-on experience in applying and developing concepts and tools for modern qualitative and quantitative analysis. Prerequisites: STAT 142 and ISR 253. (Formerly listed as PLSC 254 and SOC 254)

### 286 - SOCIAL RESEARCH PRACTICUM 2

1.00 Credit

Participation in the Institute for Social Research. Work as part of a team, under the direction of a Research Fellow in the Institute of Social Research. Prerequisite: IRS 186 or permission of the instructor. Graded S/U.

### 386 - SOCIAL RESEARCH PRACTICUM 3

1.00 Credit

Participation in the Institute for Social Research, including some leadership responsibilities under the direction of a Research Fellow. Prerequisite: ISR 286 or permission of the instructor. Graded S/U.

### 486 - SOCIAL RESEARCH PRACTICUM 4

1.00 Credit

Participation in the Institute for Social Research under the direction of a Research Fellow. Student assumes responsibility as a project director or assistant project director. Prerequisite: ISR 386 or permission of the instructor. Graded S/U.

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## DEPARTMENT OF MATHEMATICS

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Professors Boyadzhiev, Hovis, Putt; Associate Professors Fuller (*Chair*), Johns, Raiti, Retterer, Roepke; Assistant Professors Mi. Caragiu, Gleit, Hunt; Visiting Instructors Rader, Russell; Lecturer Schroeder

### Mission Statement

The mission of the Department of Mathematics is to provide an environment in which students grow intellectually and which encourages the continued professional growth of the faculty. To achieve this, the department is committed to introducing students to the concepts used in mathematics, to giving them experiences in the development and application of mathematical theory, to helping them develop their critical and analytical reasoning skills, to exposing them to the relationships between mathematics and other fields of endeavor and to preparing them for their career choices.

The **Mary Reichelderfer Chair in Mathematical Sciences** was established in 1983 from funds of the estate of Mary K. Werkman. The 2002-03 recipient of this chair Dr. Maria Raiti, associate professor of mathematics.

The department offers majors in mathematics and mathematics/statistics as well as minors in mathematics, applied mathematics and applied statistics. Courses are offered in mathematics and statistics to complement almost all disciplines in the university. Students with a primary major in the de-

partment may choose a general education program leading to either the bachelor of arts degree or the bachelor of science degree. In addition, the department cooperates with the Center for Teacher Education in program planning for licensure for those desiring to teach at the secondary school level. The secondary education program in mathematics is nationally accredited by the National Council of Teachers of Mathematics.

Students should consult with the department in which they are considering a major to determine the best choice of courses in mathematics and statistics. In general, the sequence 144-145-146 is designed for students in business administration, 154-155-156-256 for students in pharmacy and life sciences, 163-164-165-263 for students in engineering, physical sciences, mathematics and computer science, 172-173 for prospective early childhood and middle childhood teachers. Both MATH 144 (Finite Mathematics) and STAT 142 (Introduction to Statistics) should be of general interest to students in many areas.

MATH 120 and 122 are designed for students who require or desire additional preparation in algebra (120) or trigonometry (122) before enrolling in other required mathematics courses. The department recommends that MATH 120 not be used to satisfy the general education requirement. The two courses MATH 161 and 162 are designed to incorporate a review of pre-calculus mathematics into the material covered in MATH 163. After completing both MATH 161 and MATH 162 a student is prepared to enter MATH 164. The student who needs intensive skill development before taking MATH 163 should take MATH 120 and 122; the student needing only a review of pre-calculus mathematics should take the MATH 161-162 sequence in place of MATH 163.

MATH 105 is designed to meet the needs of students who, although otherwise well-prepared for college work, require remedial work in mathematics before beginning the mathematics required for their chosen major. Because it is a remedial course it carries credit neither toward graduation nor toward any major or minor. It does, however, count in the student's load, rank and GPA calculation. Entrance into MATH 105 is determined by the departmental placement program. Students whose ACT in mathematics is below 16 (SAT below 370) usually need to take this course before enrolling in any other mathematics course.

All courses in mathematics which are to be counted toward a mathematics department major or minor must be completed with a grade of "C" or better.

### Department Co-op Program

Students with a major in the department seeking a co-op experience must enroll in MATH 350 (1 hour). At least sophomore status is required for application for admission into a co-op program. Participation requires junior or senior status. Participants must agree to

- register for at least 12 hours of course work each term on campus.

- register for MATH 350 for each term at the co-op site.
- maintain an overall grade point average of at least 2.5.
- submit a co-op practicum report to the departmental co-op director during the ninth week of each work term.
- allow release of academic record to co-op employer and prospective employers and to allow the co-op employer to release employment record to Ohio Northern University.
- arrange to meet all deadlines for completion of paperwork normally associated with attendance at Ohio Northern University (e.g. advance registration, grants and loans, etc.)

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

### Mathematics Major Core

For any major in the department, the student must complete the following core courses:

MATH 163	Calculus 1
MATH 164	Calculus 2
MATH 165	Calculus 3
MATH 263	Calculus 4
MATH 272	Linear Algebra
MATH 294	Foundations of Mathematics
MATH 370	Junior Seminar
MATH 493	Senior Mathematical Exposition

In addition, ECCS 164 (Programming 1) is a required cognate course.

### Mathematics Major

In addition to the core requirements listed above, the mathematics major must then complete one of the following two sequences:

#### \*\*\* Track 1 \*\*\*

MATH 275	Differential Equations
MATH 311	Abstract Algebra 1
MATH 312	Abstract Algebra 2
MATH 352	Real Analysis 1
MATH 353	Real Analysis 2
STAT 280	Stat for Sci/Engr
or	
MATH 480	Probability Models
MATH 3XX	Elective
MATH 3XX	Elective
MATH 492	Senior Research



**\*\*\* Track 2 \*\*\***

MATH 245	History of Math
MATH 301	Math for Sec. Teaching
or	
MATH 3XX	Elective
MATH 275	Differential Equations
or	
MATH 332	Operations Research
MATH 311	Abstract Algebra 1
MATH 336	Discrete Mathematics
MATH 352	Real Analysis 1
STAT 280	Stat for Sci/Engr.
or	
MATH 480	Probability Models
and	
MATH 481	Math Statistics 1
MATH 421	Foundations of Geometry
MATH 492	Senior Research

A student planning on graduate study in mathematics should complete the requirements in track 1. A student who completes track 2 (including MATH 301) will have met the Ohio mathematics requirements for Adolescent Teacher Licensure in mathematics.

**Mathematics/Statistics Major**

In addition to the mathematics major core requirements listed above, the mathematics/statistics major must complete the following sequence of courses:

STAT 280	Statistics for Scientists and Engineers
or	
STAT 156	Biostatistics 1
STAT 281	Applied Regression
STAT 390	Topics in Statistics (completed twice under two distinct topics)
MATH 352	Real Analysis
MATH 480	Probability Models
MATH 481	Mathematical Statistics I
MATH 482	Mathematical Statistics 2
STAT 491	Statistics Practicum

or  
MATH 492 Senior Research  
At least three courses in a cognate area approved by the Mathematics Department.

Mathematics/statistics majors are strongly encouraged to complete a minor or option in the cognate area.

**Mathematics Minor Core**

For either the mathematics or the applied mathematics minor, the student must complete the following courses:

MATH 163	Calculus 1
MATH 164	Calculus 2
MATH 165	Calculus 3
MATH 272	Linear Algebra

**Mathematics Minor**

In addition to the core requirements listed above, the mathematics minor must complete the following courses:

MATH 294 Foundations of Mathematics  
At least three additional MATH courses numbered 245 or higher and approved by the Mathematics Department. One of these must be a 300 or 400 level course.

**Applied Mathematics Minor**

In addition to the core requirements listed above, the applied mathematics minor must complete the following courses:

MATH 263 Calculus 4  
MATH 275 Differential Equations  
At least two courses selected from MATH 332, 336, 362, 363, 461, 462, 480, STAT 281, 390.

**Applied Statistics Minor**

The applied statistics minor must complete the following courses:

At least two MATH courses numbered 120 or higher, including one of the following: MATH 145, 154, 161, 163.

One of the following four STAT courses: STAT 142, 146, 156, 280.

STAT 256 Biostatistics 2  
or  
STAT 281 Applied Regression  
STAT 390 Topics in Statistics (completed three times under three distinct topics)

**Subject - Mathematics (MATH)****000 - ORIENTATION***1.00 Credit*

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

**105 - INTERMEDIATE ALGEBRA***4.00 Credits*

Algebraic expressions and operations, equations and problem solving, special products and factoring, linear equations, simultaneous equations, exponents, radicals and graphs. For the student whose score on the mathematics placement exam indicates the need for a review of the fundamentals of algebra. Usually the student whose Math ACT is less than 16 should expect to take this course. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY.

## **120 - COLLEGE ALGEBRA**

### *4.00 Credits*

The real number system, polynomials. Equations and inequalities, functions and their graphs, polynomial and rational functions, exponential and logarithmic functions. Not open for credit to students who have received a grade of C or higher in any Calculus course. Recommended background: Two years of high school algebra.

## **122 - COLLEGE TRIGONOMETRY**

### *3.00 Credits*

Trigonometric functions, identities, solutions of triangles, complex numbers. Not open for credit to students who have received a grade of C or higher in MATH 163 or above. Recommended background: MATH 120 or its equivalent.

## **144 - FINITE MATHEMATICS**

### *4.00 Credits*

Introduction to and applications of topics from algebra and finite mathematics relevant to business: equations and inequalities, systems of linear equations and matrices, linear programming, mathematics of finance, and game theory. Recommended background: Two years of high school algebra.

## **145 - CALCULUS WITH BUSINESS APPLICATIONS**

### *4.00 Credits*

Algebra and calculus as relevant to business: algebraic, exponential, and logarithmic functions and their graphs, differentiation and applications of the derivative, introduction to integration. Recommended background: MATH 144.

## **154 - CALCULUS FOR LIFE SCIENCES 1**

### *4.00 Credits*

Concepts of differentiation and integration applied to algebraic, exponential, and logarithmic functions. Prerequisite: MATH 120 or equivalent is recommended.

## **155 - CALCULUS FOR LIFE SCIENCES 2**

### *4.00 Credits*

Continuation of MATH 154. Additional topics in integration, functions of several variables, elementary differential equations, and probability. Prerequisite: MATH 154 or equivalent.

## **161 - CALCULUS 1A/PRE-CALCULUS**

### *5.00 Credits*

A fast-paced review of algebraic and trigonometric functions. Limit of a function, continuity, the derivative, the antiderivative. MATH 161 and 162 together form the equivalent of MATH 163 and an intensive pre-calculus course. Recommended background: Two years of high school algebra and one-half year of high school trigonometry.

## **162 - CALCULUS 1B/PRE-CALCULUS**

### *5.00 Credits*

A continuation of MATH 161. Continued review of algebra and trigonometry. Extrema, curve plotting, Mean Value Theorem, applications of the derivative. Brief introduction to definite and indefinite integrals and the Fundamental theorem of Calculus. MATH 161 and 162 together form the equivalent of MATH 163 and an intensive Pre-Calculus course. Prerequisite: MATH 161.

## **163 - CALCULUS 1**

### *5.00 Credits*

Limit of a function, continuity, the derivative, extrema, curve plotting, Mean Value Theorem, applications of the derivative. Recommended background: Two years of high school algebra and one-half year of high school trigonometry.

## **164 - CALCULUS 2**

### *4.00 Credits*

The Fundamental Theorem of Calculus, applications of the integral, the exponential function and inverse functions, techniques of integration. Prerequisite: MATH 162 or 163. (Formerly MATH 261).

## **165 - CALCULUS 3**

### *4.00 Credits*

Sequences and series, Taylor series, polar coordinates, parametric equations, conic sections, vectors, planes and lines in space. Prerequisite: MATH 164. (Formerly MATH 262).

## **172 - FUNDAMENTAL MATHEMATICS 1**

### *5.00 Credits*

Problem solving skills and techniques, elementary set theory, whole numbers, integers, rationals and reals, theory of arithmetic, and introductory number theory. Open only to early and middle childhood education majors.

## **173 - FUNDAMENTAL MATHEMATICS 2**

### *4.00 Credits*

Microsoft Works, fundamentals of counting, probability and statistics. Logo and turtle geometry, geometric figures, measurement, congruence, symmetry, constructions, transformations and similarity. Open only to early and middle education majors.

## **190 - SPECIAL TOPICS IN MATHEMATICS**

### *1.00 to 5.00 Credits*

## **245 - HISTORY OF MATHEMATICS**

### *4.00 Credits*

The history and origin of mathematics, restricted principally to mathematics through elementary calculus. A chronological study of some mathematicians and their contributions to mathematical thought. Prerequisites: MATH 155 or 164.

### **263 - CALCULUS 4**

#### *4.00 Credits*

Vector-valued functions, multivariate functions, spherical and cylindrical coordinates, differential calculus of multivariate functions, integral calculus of multivariate functions. Prerequisite: MATH 165.

### **272 - INTRODUCTION TO LINEAR ALGEBRA**

#### *4.00 Credits*

Linear systems and Gauss elimination. Vector spaces. Linear transformations and their matrices. Eigenvalues and eigenvectors. Application to systems of first-order constant coefficient differential equations. Prerequisites: MATH 164 or consent of instructor.

### **275 - DIFFERENTIAL EQUATIONS**

#### *5.00 Credits*

First and second order linear differential equations with applications. Laplace transforms, power series solutions. Continued applications of linear algebra to systems of first order differential equations. Prerequisites: MATH 165 and 272.

### **290 - SPECIAL TOPICS IN MATHEMATICS**

#### *1.00 to 4.00 Credits*

### **294 - FOUNDATIONS OF MATHEMATICS**

#### *4.00 Credits*

Sets, logic and mathematical proof; application of these concepts. Prerequisite: MATH 164.

### **297 - INDEPENDENT STUDY IN MATHEMATICS**

#### *1.00 to 4.00 Credits*

Course may be repeated as topic varies.

### **301 - MATHEMATICS FOR SECONDARY TEACHERS**

#### *4.00 Credits*

Enrichment and application topics for secondary school mathematics based on an advanced understanding of mathematics and mathematical proof.

### **311 - ABSTRACT ALGEBRA 1**

#### *4.00 Credits*

Algebraic structures, groups, rings and fields. Prerequisite: MATH 294.

### **312 - ABSTRACT ALGEBRA 2**

#### *4.00 Credits*

Continuation of MATH 311. Offered as needed. Prerequisite: MATH 311.

### **324 - TOPOLOGY**

#### *3.00 Credits*

General point set topology and metric spaces. Offered as needed. Prerequisites: MATH 165 and 294.

### **332 - OPERATIONS RESEARCH**

#### *4.00 Credits*

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

### **336 - DISCRETE MATHEMATICS**

#### *4.00 Credits*

An introduction to discrete mathematical structures: sets, logic, combinatorics, relations and digraphs, functions, elementary graph theory, partially ordered sets, lattices and Boolean Algebras, Karnaugh maps and simple circuit design. Prerequisite: MATH 164.

### **350 - PROFESSIONAL PRACTICE**

#### *1.00 Credit*

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

### **352 - REAL ANALYSIS 1**

#### *4.00 Credits*

Mathematical induction, properties of real and rational numbers, sequences, convergence, limits of functions. (Formerly MATH 452.) Prerequisites: MATH 263 and 294.

### **353 - REAL ANALYSIS 2**

#### *4.00 Credits*

Continuous functions in real Cartesian spaces, theory of functions of one variable (differentiation and integration). (Formerly MATH 453.) Offered on demand. Prerequisite: MATH 352.

### **362 - FOURIER ANALYSIS AND PDES**

#### *4.00 Credits*

Fourier series, fourier integrals, applications, the heat equation, the wave equation, additional methods for solving PDEs. Offered alternate years. Prerequisite: MATH 165.

### **363 - COMPLEX VARIABLES**

#### *4.00 Credits*

Complex algebra, complex calculus, analytic functions, infinite series over the complex plane, theory of residues, conformal mapping. Offered alternate years. Prerequisite: MATH 263.

### **370 - JUNIOR SEMINAR**

*1.00 Credit*

Career options, graduate and professional school options, attendance at departmental seminars and Capstone presentations, mathematics as a computational science, the synergy between mathematics and technology. Prerequisite: Mathematics major with junior standing.

### **390 - SPECIAL TOPICS IN MATHEMATICS**

*1.00 to 4.00 Credits*

### **421 - FOUNDATIONS OF GEOMETRY**

*4.00 Credits*

An axiomatic approach to geometry including the concepts of incidence, ordering, separation, and congruence in incidence, affine, Euclidean and non-Euclidean geometries. Offered alternate years. Prerequisite: MATH 294.

### **423 - PROJECTIVE GEOMETRY**

*3.00 Credits*

Projectivities, perspective triangles, quadrangular sets, harmonic sets, duality, fundamental theorem and Pappus's Theorem, polarities, the conic, finite projective plane, parallelism, coordinates. Offered as needed. Prerequisite: MATH 421.

### **461 - NUMERICAL ANALYSIS 1**

*4.00 Credits*

Matlab is used as a programming language to numerically solve problems in algebra and calculus involving linear and nonlinear equations. Real and complex roots, interpolation, fixed point recursion, accuracy and precision. Matrix inversion, ill-conditioned systems of linear equations and eigenvalues. Chebyshev polynomials and economized power series. Offered alternate years. Prerequisites: MATH 165 and 272.

### **462 - NUMERICAL ANALYSIS 2**

*3.00 Credits*

Matlab is used as a programming language to numerically solve problems in calculus and differential equations. Finite and divided differences, curve fitting, orthogonal polynomials, numerical differentiation and integration, numerical solutions of ordinary differential equations by series, Runge-Kutta and predictor-corrector methods. Numerical Analysis 1 is not a prerequisite. Offered alternate years. Prerequisites: MATH 272 and 275.

### **470 - MATHEMATICS INTERNSHIP**

*2.00 to 12.00 Credits*

Practical experience in the mathematical sciences. The experience may occur either on campus or at some off-campus site. Open to majors in the Department of Mathematics who have completed 6 quarters of work and have junior standing. Graded S/U.

### **480 - PROBABILITY MODELS**

*4.00 Credits*

Axioms of probability theory, discrete and continuous random variables, introduction to stochastic processes. Offered alternate years. Prerequisite: MATH 263.

### **481 - MATHEMATICAL STATISTICS 1**

*4.00 Credits*

Probability models, random variables, sampling, estimation, hypothesis testing, non-parametric procedures, regression, and correlation. Offered alternate years. Prerequisites: MATH 263 and 480.

### **482 - MATHEMATICAL STATISTICS 2**

*4.00 Credits*

Hypothesis testing, ANOVA, analysis of enumerative data, non-parametric statistics. Offered alternate years. Prerequisite: MATH 481.

### **490 - SPECIAL TOPICS IN MATHEMATICS**

*1.00 to 4.00 Credits*

### **492 - SENIOR RESEARCH**

*1.00 Credit*

Exploration of a topic in mathematics with faculty supervision. Research for an expository paper. Graded S/U. Prerequisite: Consent of the instructor or department chairman.

### **493 - SENIOR EXPOSITION**

*1.00 Credit*

The student prepares a paper and gives a lecture on work done in either STAT 491 or MATH 492. Prerequisite: STAT 491 or MATH 492.

### **494 - SEMINAR IN MATHEMATICS**

*1.00 to 4.00 Credits*

### **497 - INDEPENDENT STUDY IN MATHEMATICS**

*1.00 to 4.00 Credits*

**142 - INTRODUCTION TO STATISTICS****4.00 Credits**

Descriptive statistics, probability, binomial distribution, normal distribution, confidence intervals, hypothesis testing. Statistical calculator required. Recommended background: MATH 105 or its equivalent. Formerly MATH 142.

**146 - BUSINESS STATISTICS****4.00 Credits**

Basic statistical techniques with emphasis on their applications in the field of business. Recommended background: MATH 145 or its equivalent. Formerly MATH146.

**156 - BIOSTATISTICS 1****4.00 Credits**

Basic statistical techniques with emphasis on applications to biological and health sciences. Recommended background: MATH 120 or its equivalent. Formerly MATH 156.

**256 - BIOSTATISTICS 2****4.00 Credits**

Review of inferential statistics, analysis of variance, linear and multiple regression and correlation, and non-parametric statics. Prerequisite: STAT 156. Formerly MATH 256.

**280 - STATISTICS FOR SCIENTISTS AND ENGINEERS****4.00 Credits**

Basic statistical techniques: random variables and their distributions, estimation, hypothesis testing, and linear regression. Prerequisite: MATH 164. Formerly MATH 380.

**281 - APPLIED REGRESSION****4.00 Credits**

Linear and multiple regression with applications. Prerequisite: STAT 142 and permission of instructor; STAT 146 and permission of instructor; STAT 156 or STAT 280.

**390 - SPECIAL TOPICS IN STATISTICS****4.00 Credits**

A particular area of statistics will be selected for in depth study. Possible areas of investigation include categorical data analysis, experimental design, multivariate statistics, nonparametric statistics, survey sampling, time series analysis, and statistical computing. May be repeated for a maximum of 24 hours credit. Prerequisite: STAT 256 or STAT 281.

**491 - STATISTICS PRACTICUM****1.00 Credit**

The student will serve as a statistical consultant under faculty supervision. The student will work on a statistical project as a service to some component of the university community. Prerequisite: STAT 256 or STAT 281.

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**DEPARTMENT OF MODERN LANGUAGES**

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Professors Davey, Dufault (*Chair*), Lippert; Associate Professors Finn, Walter; Assistant Professor Billat; Lecturers Black, Brentlinger, Sutherland

**Mission Statement**

The Mission of the Department of Modern Languages is to provide students with opportunities to learn to speak, understand, read, and write other languages.

The study of a language different from one's own promotes communication with another culture on its own terms, through its peoples, literatures, histories and experiences of itself as a part of humanity. While such communication has, in an electronic age, been greatly facilitated by technology, real understanding between peoples requires mutual knowledge and respect. Language study opens a door onto the diversity of our world, and so forms an important part of a humanities education.

In its instruction, the Department of Modern Languages employs teaching methods that promote communication. Classrooms are equipped for multimedia instruction, and instructors typically incorporate a variety of media and methodology in daily lessons. The University Audio Center maintains an area where students may practice listening and speaking skills, as well as obtain materials for out-of-class study.

The Department encourages its majors to combine their study of a second language with another area of study; having a second major is an attractive and viable option for many students.

As a member of the University Studies Abroad Consortium (USAC), Ohio Northern offers students the opportunity to spend time in several countries. While studying abroad for a summer, one, or two semesters, students can earn ONU credit and greatly enhance their linguistic and cultural expertise. These programs may also count toward the Capstone Experience required of all Modern Language majors. Students may chose from a wide variety of programs including those in France, Germany and several Spanish-speaking countries.

The department administers placement tests to help students determine their appropriate course level. Placement credit counts toward fulfillment of requirements for language majors and minors, and toward language competency requirements. Placement toward a major can also be given, at the discretion of the Department, for non-traditional course work done while studying abroad.

Apart from the courses listed, Independent Studies can be arranged with members of the faculty. Because of the interactive nature of the elementary level courses, there can be no inde-

pendent studies at the 100-level. Independent study courses may also count toward the major; these are limited to four credit hours in the case of the 52-hour major and to eight credit hours for the 68-hour major. Independent Studies can also be arranged for study of other, less commonly taught languages, as availability of instructors permits.

At Ohio Northern University, students can earn the Bachelor of Arts degree in French, German and Spanish (with teacher licensure if desired) or a minor in French, German or Spanish.

#### **Major in French (52 hours)**

FREN 120 Elementary French 1  
FREN 121 Elementary French 2  
FREN 122 Elementary French 3  
FREN 214 Intermediate French 1  
FREN 215 Intermediate French 2  
FREN 216 Intermediate French 3  
FREN 310 Advanced French: Reading  
FREN 311 Advanced French: Speaking  
FREN 312 Advanced French: Writing

Four more courses (two in civilization)

Capstone experience: study abroad (recommended) or research project.

#### **Major in French: teacher licensure (68 hours)**

The major

Four additional courses (two in literature)

#### **Major in German (52 hours)\***

GRMN 130 Elementary German 1  
GRMN 131 Elementary German 2  
GRMN 132 Elementary German 3  
GRMN 224 Intermediate German 1  
GRMN 225 Intermediate German 1  
GRMN 226 Intermediate German 1  
GRMN 311 Advanced German 1  
GRMN 312 Advanced German 2  
GRMN 313 Advanced German 3

Four more courses (two in civilization)

Capstone experience: study abroad (**required**)

\*Other German courses at or above the 300-level required to complete the major must normally be taken at the University of Lüneburg in Germany.

#### **Major in German: teacher licensure (68 hours)**

The major

Four additional courses (two in literature)

#### **Major in Spanish (52 hours)**

SPAN 140 Elementary Spanish 1  
SPAN 141 Elementary Spanish 2  
SPAN 142 Elementary Spanish 3  
SPAN 244 Intermediate Spanish 1  
SPAN 245 Intermediate Spanish 2  
SPAN 246 Intermediate Spanish 3  
SPAN 341 Spanish Conversation/Composition  
SPAN 342 Advanced Spanish Language

Five additional courses (two in civilization)

Capstone experience: study abroad (recommended) or research project.

#### **Major in Spanish: teacher licensure (68 hours)**

The major

Four additional courses (two in literature)

#### **Minor in French (36 hours)**

FREN 120 Elementary French 1  
FREN 121 Elementary French 2  
FREN 122 Elementary French 3  
FREN 214 Intermediate French 1  
FREN 215 Intermediate French 2  
FREN 216 Intermediate French 3  
FREN 310 Advanced French: Reading  
FREN 311 Advanced French: Speaking  
FREN 312 Advanced French: Writing

#### **Minor in German (36 hours)**

GRMN 130 Elementary German 1  
GRMN 131 Elementary German 2  
GRMN 132 Elementary German 3  
GRMN 224 Intermediate German 1  
GRMN 225 Intermediate German 2  
GRMN 226 Intermediate German 3  
GRMN 311 Advanced German 1  
GRMN 312 Advanced German 2  
GRMN 313 Advanced German 3

#### **Minor in Spanish (36 hours)**

SPAN 140 Elementary Spanish 1  
SPAN 141 Elementary Spanish 2  
SPAN 142 Elementary Spanish 3  
SPAN 244 Intermediate Spanish 1  
SPAN 245 Intermediate Spanish 2  
SPAN 256 Intermediate Spanish 3  
SPAN 341 Spanish Conversion/Composition  
SPAN 342 Advanced Spanish Language

One additional course

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### **Subject - French (FREN)**

#### **120 - ELEMENTARY FRENCH 1**

4.00 Credits

Basic proficiency in understanding, speaking, reading and writing French in everyday situations. Emphasis on comprehension and speaking. Audio visual materials illustrate French and francophone ways of life. Four classes per week.

#### **121 - ELEMENTARY FRENCH 2**

4.00 Credits

Continuation of FREN 120. Four classes per week. Prerequisite: FREN 120 or proficiency established by placement test.

#### **122 - ELEMENTARY FRENCH 3**

4.00 Credits

Continuation of FREN 121. Four classes per week. Prerequisite: FREN 121 or proficiency established by placement test.

**214 - INTERMEDIATE FRENCH 1***4.00 Credits*

Continued development of proficiency in understanding, speaking, reading and writing French. Emphasis on high- frequency vocabulary and grammatical structures as well as phonetics. Audio visual materials illustrate language usage and cultural contexts. Four classes per week. Prerequisite: FREN 122 or proficiency established by placement test.

**215 - INTERMEDIATE FRENCH 2***4.00 Credits*

Continuation of FREN 214. Prerequisite: FREN 214 or proficiency established by placement test.

**216 - INTERMEDIATE FRENCH 3***4.00 Credits*

Continuation of FREN 215. Prerequisite: FREN 215 or proficiency established by placement test.

**219 - INTRODUCTION TO FRENCH LITERATURE***4.00 Credits*

Basic principles of analyzing and appreciating French poetry, prose and theatre. Reading and discussion in French of representative texts. Four classes per week. Prerequisite: FREN 215 and permission of the department.

**297 - INDEPENDENT STUDY IN FRENCH***1.00 to 4.00 Credits*

May be repeated as topic varies.

**310 - ADVANCED FRENCH: READING***4.00 Credits*

Development of reading skills through authentic cultural and literary texts. Vocabulary building. Review of grammar as needed. Prerequisite: FREN 216.

**311 - ADVANCED FRENCH: SPEAKING***4.00 Credits*

Intensive practice of oral communication in conversations, role playing, oral interviews. Oral reports on authentic texts and oral interpretation of dramatic scenes or poetry may be included. Review of phonetic symbols and sounds. Prerequisite: FREN 216.

**312 - ADVANCED FRENCH: WRITING***4.00 Credits*

Intensive writing practice including letters, resumes of interviews and accounts of personal experiences. Written analysis of authentic texts. Vocabulary development. Review of grammar as needed. Prerequisite: FREN 216.

**313 - BUSINESS FRENCH***4.00 Credits*

Development of oral and written proficiency within a business context. Business vocabulary, readings, business and cultural concepts, and situational practice. Assumes mastery of basic French grammar and vocabulary. Prerequisite: FREN 216 and permission of the department.

**315 - THE FRENCH TEXT: THE NOVEL***4.00 Credits*

Reading and discussion in French of representative works in their historical and cultural contexts. Four classes per week. Prerequisite: FREN 310 or 312.

**316 - THE FRENCH TEXT: THE ESSAY AND NON-LITERARY TEXTS***4.00 Credits*

Reading and discussion in French of representative classic authors and texts from contemporary French periodicals. Four classes per week. Prerequisite: FREN 310 or 312.

**319 - FRENCH POETRY AND SONG***4.00 Credits*

Discussion and analysis in French of representative French and francophone works in their historical and cultural contexts. Rules of French versification. Interpretations of poetry into song. Classic and contemporary "chansonniers." Four classes per week. Prerequisite: FREN 310 or 312.

**324 - THE FRENCH FILM***4.00 Credits*

Viewing of representative films and discussion in French of well-known directors and actors, from the origins of French cinema to the present. Four classes per week. Prerequisite: FREN 216 and permission of the department.

**327 - FRENCH CIVILIZATION: CONTEMPORARY FRANCE***4.00 Credits*

Discussion in French of twentieth century French culture with emphasis on the family, education, employment, politics, technology and cultural values based on videos, readings and other authentic materials. Four classes per week. Prerequisite: FREN 310 or 312.

**328 - FRENCH CIVILIZATION: HISTORY OF FRANCE***4.00 Credits*

Discussion in French of the history, political institutions and artistic expressions of France from their origins to the twentieth century. Films, slides and appropriate texts enhance historical perspectives and emphasize cultural values. Four classes per week. Prerequisite: FREN 310 or 312.

### **329 - FRENCH CIVILIZATION: FRANCOPHONE CULTURES**

#### *4.00 Credits*

Discussion in French of francophone cultures, emphasizing Quebec and West Africa, in terms of historical perspectives and contemporary concerns. Video, films, slides and appropriate texts illustrate cultural values and provide the basis for discussion. Four classes per week. Prerequisite: FREN 310 or 312. NOTE: Fulfills the non-Western studies requirement.

### **390 - SPECIAL TOPICS IN FRENCH**

#### *1.00 to 4.00 Credits*

May be repeated as topic varies. Prerequisite: FREN 310 or 312.

### **405 - MODERN FRENCH MUSICAL**

#### *4.00 Credits*

The visual, auditory, and lyrical elements of musical theatre as "text." Opportunities to enrich and enhance literary analytical skills in a multi-media environment while improving linguistic competencies and cultural knowledge. Prerequisites: FREN 310 or 312.

### **416 - THE FRENCH THEATRE**

#### *4.00 Credits*

Reading and discussion in French of representative works from the seventeenth century to the present. Recordings, films, and actual performances enhance discussions as available and appropriate. Four classes per week. Prerequisite: FREN 310 or 312.

### **418 - FRANCOPHONE LITERATURE OF THE TWENTIETH CENTURY**

#### *4.00 Credits*

Reading and discussion in French of works by contemporary writers in various French-speaking countries. Four classes per week. Prerequisite: FREN 310 or 312. NOTE: Fulfills the non-Western studies requirement.

### **497 - INDEPENDENT STUDY IN FRENCH**

#### *1.00 to 4.00 Credits*

May be repeated as topic varies.

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## **Subject - German (GRMN)**

### **130 - ELEMENTARY GERMAN 1**

#### *4.00 Credits*

Basic proficiency in understanding, speaking, reading and writing German in everyday situations. Emphasis on comprehension and speaking. Audio visual materials illustrate life in Germany and Austria. Four classes per week.

### **131 - ELEMENTARY GERMAN 2**

#### *4.00 Credits*

Continuation of GRMN130. Four classes per week. Prerequisite: GRMN 130 or proficiency established by placement test.

### **132 - ELEMENTARY GERMAN 3**

#### *4.00 Credits*

Continuation of GRMN 131. Four classes per week. Prerequisite: GRMN 131 or proficiency established by placement test.

### **224 - INTERMEDIATE GERMAN 1**

#### *4.00 Credits*

Continued development of proficiency in understanding, speaking, reading and writing German. Emphasis on high-frequency vocabulary and grammatical structures, short writing assignments. Authentic materials and videos illustrate language usage and cultural context. Four classes per week. Prerequisite: GRMN 132 or proficiency established by placement test.

### **225 - INTERMEDIATE GERMAN 2**

#### *4.00 Credits*

Continuation of GRMN 224. Four classes per week. Prerequisite: GRMN 224 or proficiency established by placement test.

### **226 - INTERMEDIATE GERMAN 3**

#### *4.00 Credits*

Continuation of GRMN 225. Four classes per week. Prerequisite: GRMN 225 or proficiency established by placement test.

### **261 - INTRODUCTION TO GERMAN LITERATURE**

#### *4.00 Credits*

Basic principles of analyzing and appreciating German essays, short stories, poetry, plays, novellas. Vocabulary building. Reading and discussions in German. Four classes per week. Prerequisite: GRMN 225.

### **298 - INDEPENDENT STUDY IN GERMAN**

#### *1.00 to 4.00 Credits*

May be repeated as topic varies.

### **311 - ADVANCED GERMAN 1**

#### *4.00 Credits*

Intensive practice of grammatical structures. Conversation, discussion, written analysis of various authentic materials. Four classes per week. Prerequisite: GRMN 226 or permission of instructor.

### **312 - ADVANCED GERMAN 2**

#### *4.00 Credits*

Intensive practice of grammatical structures. Conversation, discussion, written analysis of various authentic materials. Four classes per week. Prerequisite: GRMN 226 or permission of instructor.

### **313 - ADVANCED GERMAN 3**

#### *4.00 Credits*

Intensive practice of grammatical structures. Conversation, discussion, written analysis of various authentic materials. Four classes per week. Prerequisite: GRMN 226 or permission of instructor.



### **336 - BUSINESS GERMAN**

#### *4.00 Credits*

Vocabulary and language structures pertaining to business culture in Germany. Letter and resume writing. Video and authentic materials. Four classes per week. Prerequisite: GRMN 226.

### **337 - GERMAN CIVILIZATION**

#### *4.00 Credits*

Political, economic, social and cultural forces in German-speaking Central Europe from the 5th century AD to the present. Discussion in German. Four classes per week. Prerequisite: GRMN 226.

### **338 - CONTEMPORARY GERMANY AND AUSTRIA**

#### *4.00 Credits*

German and Austrian culture since the Second World War with emphasis on family, education, employment, politics, technology, and social values based on readings, videos and other materials. Discussion in German. Four classes per week. Prerequisite: GRMN 226.

### **361 - GERMAN LITERATURE**

#### *4.00 Credits*

Readings and discussion in German of drama, the Novelle, poetry, the short story. Four classes per week. Prerequisite: GRMN 226 or permission of the department.

### **391 - SPECIAL TOPICS IN GERMAN**

#### *1.00 to 4.00 Credits*

May be repeated as topic varies. Prerequisite: GRMN 226 or permission of the department.

### **498 - INDEPENDENT STUDY IN GERMAN**

#### *1.00 to 4.00 Credits*

May be repeated as topic varies.

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## **Subject - Modern Languages (MLNG)**

### **111 - JAPANESE**

#### *1.00 to 3.00 Credits*

Individualized study of modern spoken Japanese. Coverage of material based on number of credits applied for (1-3). Will meet one hour per week with tutor for additional help and practice. Availability may vary from quarter to quarter. Graded S/U. NOTE: This course will not meet the general education language requirement.

### **112 - WELSH**

#### *1.00 to 3.00 Credits*

Individualized study of modern spoken Welsh. Coverage of material based on number of credits applied for (1-3). Will meet one hour per week with tutor for additional help and practice. Availability may vary from quarter to quarter. Graded S/U. NOTE: The course will not meet the general education language requirement.

### **113 - PORTUGUESE (BRAZILIAN)**

#### *1.00 to 3.00 Credits*

Individualized study of modern spoken Brazilian Portuguese. Coverage of material based on number of credits applied for (1-3). Will meet one hour per week with tutor for additional help and practice. Graded S/U. NOTE: This course will not meet the general education language requirement.

### **190 - INDIVIDUALIZED LANGUAGE STUDY**

#### *1.00 to 3.00 Credits*

Individualized study of a modern spoken language for motivated students with a particular interest in or need for study of languages other than French, German, Spanish or Russian. Availability of any given language may vary from quarter to quarter. See department. Coverage of material based on number of credits applied for (1-3). Meets one hour per week with tutor for additional help and practice. Graded S/U. NOTE: These courses will not meet the general education language requirement.

### **403 - LITERATURE IN TRANSLATION**

#### *4.00 Credits*

Either Spanish, French or German literature in translation. Focus on major writers and literary trends of different periods. Lectures and assignments in English. Does not fulfill the general education language requirement.

### **499 - SENIOR ESSAY**

#### *1.00 to 4.00 Credits*

A critical essay on a topic selected in consultation with a faculty advisor. Prerequisites: Senior status; major in French or Spanish; and permission of the department.

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## **Subject - Russian (RUSS)**

### **150 - ELEMENTARY RUSSIAN 1**

#### *4.00 Credits*

Basic proficiency in understanding, speaking, reading and writing Russian in everyday situations. Emphasis on comprehension and speaking. Authentic materials illustrate life in Russia and the former Soviet Union. Four classes per week.

### **151 - ELEMENTARY RUSSIAN 2**

#### *4.00 Credits*

Continuation of RUSS 150. Four classes per week. Prerequisite: RUSS 150 or demonstrated proficiency.

### **152 - ELEMENTARY RUSSIAN 3**

#### *4.00 Credits*

Continuation of RUSS 151. Four classes per week. Prerequisite: RUSS 151 or demonstrated proficiency.

### **296 - INDEPENDENT STUDY IN RUSSIAN**

#### *1.00 to 3.00 Credits*

May be repeated. Prerequisite: Permission of the department. Graded S/U.

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## **Subject - Spanish (SPAN)**

### **140 - ELEMENTARY SPANISH 1**

#### *4.00 Credits*

Basic proficiency in understanding, speaking, reading, and writing Spanish with emphasis on listening, speaking, and pronunciation. Audio visual materials illustrate Hispanic way of life. Four classes per week.

### **141 - ELEMENTARY SPANISH 2**

#### *4.00 Credits*

Continuation of SPAN 140. Four classes per week. Prerequisite: SPAN 140 or proficiency established by placement test.

### **142 - ELEMENTARY SPANISH 3**

#### *4.00 Credits*

Continuation of SPAN 141. Four classes per week. Prerequisite: SPAN 141 or proficiency established by placement test.

### **244 - INTERMEDIATE SPANISH 1**

#### *4.00 Credits*

Continued development of proficiency in understanding, speaking, reading and writing Spanish with emphasis on pronunciation and speaking. Four classes per week. Prerequisite: SPAN 142 or proficiency established by placement test.

### **245 - INTERMEDIATE SPANISH 2**

#### *4.00 Credits*

Continuation of SPAN 244. Four classes per week. Prerequisite: SPAN 244 or proficiency established by placement test.

### **246 - INTERMEDIATE SPANISH 3**

#### *4.00 Credits*

Continuation of SPAN 245. Four classes per week. Prerequisite: SPAN 245 or proficiency established by placement test.

### **247 - INTRODUCTION TO HISPANIC LITERATURE**

#### *4.00 Credits*

Critical principles in the assessment of prose, fiction, poetry and drama as applied to selected readings in Spanish and Latin American literature. Prerequisite: SPAN 245 and permission of the department.

### **250 - SPANISH PHONETICS**

#### *4.00 Credits*

Introduction to linguistic terminology and a comparative analysis of the Spanish and English sound systems, with emphasis on improving students' pronunciation in Spanish. Prerequisite: SPAN 245 and permission of the department.

### **299 - INDEPENDENT STUDY IN SPANISH**

#### *1.00 to 4.00 Credits*

May be repeated as topic varies.

### **341 - SPANISH CONVERSATION AND COMPOSITION**

#### *4.00 Credits*

Development of greater proficiency in using vocabulary and grammatical structures through intensive oral and written practice.

Prerequisite: SPAN 246.

### **342 - ADVANCED SPANISH LANGUAGE STUDY**

#### *4.00 Credits*

Intensive study of grammar and syntax emphasizing high-frequency constructions.

Prerequisite: SPAN 246.

### **343 - BUSINESS SPANISH**

#### *4.00 Credits*

Development of oral and written proficiency within a business context. Business vocabulary, readings, business and cultural concepts, situational practice and case studies.

Prerequisite: SPAN 246 and permission of the department.

### **351 - HISPANIC CULTURAL PERSPECTIVES**

#### *4.00 Credits*

Hispanic world views with emphasis on social attitudes and lifestyles. Prerequisite: SPAN 246 and permission of the department. NOTE: Fulfills the non-Western studies requirement.

### **353 - SPANISH CIVILIZATION**

#### *4.00 Credits*

Geographical, political, economic, social and cultural forces in Spain from prehistoric times to the present. Prerequisite: SPAN 246 and permission of the department.

### **354 - LATIN AMERICAN CIVILIZATION**

#### *4.00 Credits*

Geography, history and culture of Latin America from Mezoamerica to the present. Prerequisite: SPAN 246 and permission of the department. NOTE: Fulfills the non-Western studies requirement.

### **356 - SPANISH ART, MUSIC AND DANCE**

#### *4.00 Credits*

Development of Spanish art, architecture, music and dance from prehistoric times to the present. Prerequisite: SPAN 246 and permission of the department.

### 357 - LATIN AMERICAN ART, MUSIC AND DANCE

#### 4.00 Credits

Development of Latin American art, architecture, music and dance from Mezoamerica to the present. Prerequisite: SPAN 246 and permission of the department. NOTE: Fulfills the non-Western studies requirement.

### 360 - HISPANIC MEDIA

#### 4.00 Credits

Contemporary Spanish and Latin American radio, television, newspapers and magazines. Prerequisite: SPAN 246 and permission of the department.

### 392 - SPECIAL TOPICS IN SPANISH

#### 1.00 to 4.00 Credits

May be repeated as topic varies. Prerequisites: SPAN 246, or SPAN 341 and 342, depending on topic, and permission of the department.

### 451 - SPANISH LITERATURE TO 1681

#### 4.00 Credits

Works of major Spanish authors from beginnings to Golden Age. Prerequisites: SPAN 341 and 342.

### 452 - EIGHTEENTH- AND NINETEENTH-CENTURY SPANISH LITERATURE

#### 4.00 Credits

Neoclassicism, Romanticism, Realism and Generation of 1898. Prerequisites: SPAN 341 and 342.

### 453 - TWENTIETH-CENTURY SPANISH LITERATURE

#### 4.00 Credits

Main currents of Spanish literature from the Generation of 1898 to the present. Prerequisite: SPAN 341 and 342.

### 456 - NINETEENTH-CENTURY LATIN AMERICAN LITERATURE

#### 4.00 Credits

Romanticism, Realism and Modernism. Prerequisite: SPAN 341 and 342.

### 457 - TWENTIETH-CENTURY LATIN AMERICAN LITERATURE

#### 4.00 Credits

Main currents from post-Modernism to the present. Prerequisites: SPAN 341 and 342.

### 499 - INDEPENDENT STUDY IN SPANISH

#### 1.00 to 4.00 Credits

May be repeated as topic varies.

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## DEPARTMENT OF MUSIC

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Professors D'Arca, E. Williams (*Chair*); Associate Professors Bates, Kratzer, Zank; Assistant Professor Casey; Resident Artists Osbun, R. Williams; Lecturers D. Altstaetter, L. Altstaetter, P. Ashmore, P.L. Ashmore, Chevront, Eichelberger, Ford, Gramm, Grim, Laukhuf, Leaman, Lincoln, Neeley, Pfaltzgraft, R. Pinkney, Russell, Sycks, Zickafoose

### Mission Statement

The Music Department is dedicated to the education and graduation of majors and minors who are skilled and accomplished in the musical arts and related fields. There is a strong commitment to self-development and the maximization of the unique talents and skills of the individual.

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

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

A variety of degree programs are offered: Bachelor of Music with majors in music education, performance, composition, music major: with elective studies in business; and Bachelor of Arts with a major in music. A minor in music is also offered. Specific degree requirements are listed below.

### Bachelor of Music

A candidate for the Bachelor of Music degree must complete the following general education requirements:

MUSC 000	Orientation	1 hr.
ART 100,		
COMM 105		
or equiv.	Art, Theater Appreciation	4 hrs.
COMM 211 or	Public Speaking or	
225	Interpersonal Comm.	4 hrs.
ENGL 110, 111	Writing 1 and 2	8 hrs.
ENGL 204	Great Works	4 hrs.
MLNG	2 qtrs. of one language	8 hrs.
RELG	105 or equivalent	4 hrs.

HIST 110, 111	Western Civ. 1 and 2	8 hrs.
MUSC 200	Non-Western Music	4 hrs.
Soc. Sciences	Economics (Music Majors with Elective Studies in Business take IBEC 202), GEOG 226, Pol. Sci., Psychology (Music Education Majors take PSYC 100) or Sociology	4 hrs.
Math & Natural Sciences	Mathematics, Biological or Physical Sciences - two courses (Mus. Ed. Majors take MATH 120 or equiv. and one add. course)	8 hrs.
Computer Literacy	(Mus. Ed. Majors take EDUC 320)	4 hrs.
Health & P.E.	Wellness Elective	1 hr.
	Fitness Elective	1 hr.
	Lifetime Activities	1 hr.

Participation in the college assessment program.

All majors include the following basic musicianship and supportive courses:

MUSC 001	Concert and Recital Observation (each qtr.)	0 hrs.
MUSC 100	Music	4 hrs.
MUSC 121, 122, 123	Theory of Music 1, 2, 3	9 hrs.
MUSC 131, 132, 133	Ear Training 1, 2, 3	3 hrs.
MUSC 200	Non-Western Music	4 hrs.
MUSC 221, 222, 223	Advanced Theory of Music 1, 2, 3	9 hrs.
MUSC 231, 232, 233	Adv. Ear Training 1, 2, 3	3 hrs.
MUSC 311	Counterpoint	2 hrs.
MUSC 312	Form and Analysis	2 hrs.
MUSC 313	Orchestration	2 hrs.
MUSC 321	Music History and Literature 1, 2, 3	9 hrs.
MUSC 241	Basic Conducting	2 hrs.
MUSC 342	Advanced Conducting-Instrumental	2 hrs.
MUSC 343	Adv. Conducting-Choral	2 hrs.
MUSC 280	Piano Proficiency	0 hrs.
	Must be passed by the end of fall qtr. of the junior year. Private piano is taken until the exam is passed. For specific requirements see AMUS 025 Piano Individual.	
MUSC 480	Senior Recital	0 hrs.
<i>For vocal majors only</i>		
MUSC 261	Latin/Italian Diction for Singers	1 hr.
MUSC 262	French Diction for Singers	1 hr.
MUSC 263	German Diction for Singers	1 hr.

### Bachelor of Music in Music Education Major

AMUS 015-075	Applied Mus.-Major Area	22 hrs.
AMUS 080 or 083	Major Vocal Ensemble (for voice or piano majors) each qtr.	11 hrs.
AMUS 084, 087, 090 or 096	Major Instrumental Ens. (for instrumental or piano majors) each qtr.	11 hrs.
AMUS 043	Classroom Instruments	1 hr.
MUSC 334	Woodwind Methods	2 hrs.
MUSC 336	Brass Methods	2 hrs.
MUSC 338	Percussion Methods	2 hrs.
MUSC 339	String Methods	2 hrs.
MUSC 461	Secondary Choral Meth. and Techniques	3 hrs.
MUSC 462	Secondary Instrumental Meth. and Techniques	3 hrs.
MUSC 463	Marching Band Methods and Techniques (instrumental majors only)	2 hrs.
AMUS 010 or 015	Voice Class or Individual	1+ hrs.
AMUS 020 or 025	Piano Class or Individual	1+ hrs.
Classroom Instruments (AMUS 043) must be taken before the senior year.		
Guitar Proficiency must be passed before student teaching.		
EDUC 115	Culture and Schooling	4 hrs.
EDUC 150	Five day field experience (twice)	0 hrs.
EDUC 210	Exceptional Learner	4 hrs.
EDUC 223	Child Dev. and Psy.	4 hrs.
EDUC 224	Young and Late Adolescent Psy.	4 hrs.
EDUC 285	Curriculum	4 hrs.
Admission to Teacher Education is required for the following courses:		
EDUC 320	Instructional Media and Educational Technologies	4 hrs.
EDUC 342	Read. in the Content Area	4 hrs.
EDUC 440	Classroom Strategies	4 hrs.
EDUC 445	Org. and Admin. of Schls. in Am. Society	2 hrs.
EDUC 459	Integrated Music Meth.	4 hrs.
EDUC 470	Student Teaching-Early Childhood	7 hrs.
EDUC 475	Student Teaching Sem.	1 hr.
EDUC 480	Student Teaching-Adolescent	8 hrs.

300 hours of course related field experience. Music education students are required to have Praxis 2 examination scores on file prior to student teaching. Successful completion of Praxis 2 is expected before graduation.

### Bachelor of Music in Performance Major

All performance majors must pass a thirty minute recital hearing before being admitted to the program.

AMUS 015-075	Applied Mus.-Major Area	36 hrs.
AMUS 020 or 025	Piano Class or Indv.	1+ hrs.
AMUS 080 or 083	Major Vocal Ensemble (for voice or piano majors) each qtr. or	12 hrs.
AMUS 084, 087, 090 or 096	Major Instrumental Ensemble (for instru. or piano majors) each qtr.	12 hrs.
AMUS 081, 082, 085, 089 or 099	Minor Vocal Ensemble or	6 hrs.
AMUS 088, 092, 094, 095, 096, 098 or 099	Minor Instrumental Ens.	6 hrs.
MUSC 371, 372, 373	Applied Field Lit. and Pedagogy 1, 2, 3	3 hrs.
MUSC 380	Junior Recital	0 hrs.
MUSC	Music Electives	5 hrs.
	Free Electives	18 hrs.

### Bachelor of Music in Composition Major

MUSC 015-075 Applied Music-Primary 12+ hrs. minimum with achievement of junior performance level or continued study until graduation.

	Applied Music-Sec.	6 hrs.
AMUS 025	Piano Individual	6+ hrs.
AMUS 080, 083, 084, 087, 090, or 096	Major Ensemble each qtr.	12 hrs.
MUSC 211	Electronic Music	2 hrs.
MUSC 314	Music Composition	18 hrs.
MUSC 411	Advanced Electronic Music Composition	2 hrs.
MUSC 497	Independent Study-Senior Composition Proj.	3 hrs.
MUSC	Music Electives	4 hrs.
	Free Electives	18 hrs.

All composition majors will create a portfolio for periodic review by the music faculty.

### Bachelor of Music: Music Major with Elective Studies in Business

AMUS 015-075	Applied Music-Indv. (major instrument or voice)	24 hrs.
AMUS 080, 083, 084, 087, 090, or 096	Major Ensemble (each qtr.)	12 hrs.
AMUS 025	Piano Individual	1+ hrs.
MUSC 270	Intro. To Mus. Industry	3 hrs.
IBEC 202	Principles of Microeconomics	4 hrs.
IBEC 203	Principles of Macroeconomics	4 hrs.
ACCT 211, 212	Principles of Acct. 1, 2	8 hrs.
MGMT 333	Management and Organ. Behavior	4 hrs.
MRKT 351	Principles of Marketing	4 hrs.
ABUS 312	Business Law 1	4 hrs.
COMM 380	Arts Administration	4 hrs.
MUSC 470	Music Business Internship	3 hrs.
Two courses selected from the following:		
FINC 362	Managerial Finance	4 hrs.
MGMT 325	Employment Law	4 hrs.
MGMT 334	Cases and Exercises in Organizational Behavior	4 hrs.
MGMT 363	Human Res. Management	4 hrs.
MRKT 370	Retailing	4 hrs.
MRKT 371	Personal Selling	4 hrs.
MRKT 372	Advertising	4 hrs.
MUSC	Music Electives	5 hrs.
	Non-music Electives	14 hrs.

### Bachelor of Arts in Music

The candidate for the Bachelor of Arts degree must complete the bachelor of arts general education requirements listed earlier in this catalog.

MUSC 001	Concert and Recital Observation (each qtr.)	0 hrs.
MUSC 100	Music	4 hrs.
MUSC 200	Non-Western Music	4 hrs.
MUSC 121, 122, 123	Music Theory 1, 2, 3	9 hrs.
MUSC 131, 132, 133	Ear Training 1, 2, 3	3 hrs.
MUSC 221, 222, 223	Advanced Theory of Music 1, 2, 3	9 hrs.
MUSC 231, 232, 233	Advanced Ear Training 1, 2, 3	3 hrs.
MUSC 321, 322, 323	Music History and Literature 1, 2, 3	9 hrs.
MUSC 020 or 025	Piano Class or Individual	1+ hrs.
MUSC 280	Piano Proficiency	0 hrs.
MUSC 480 or 497	Senior Project/Recital	0-3 hrs.
AMUS 015-075	Applied Music-Indv. (distributed over four yrs.)	12 hrs.

AMUS 080 or 083	Major Vocal Ensemble (for voice or piano majors) or	6 hrs.
AMUS 084, 087, 090 or 096	Major Instrumental Ensemble (for instrumental or piano majors)	6 hrs.
MUSC	Music Electives General Stud. Electives	8 hrs. 31 hrs.

A **minor in music** may be earned by taking a minimum of 39 hours which must include music 121, 122, 123, 131, 132, 133, 321, 322, 323; six quarters of private applied instruction in one area and six quarters in major performing group.

**Applied Music** Individual instruction is offered for varying hours of credit. Each music major generally takes two or three credit hours of individual instruction in his/her major applied area each quarter. Non-music majors and music majors studying minor applied areas usually register for one credit hour of class or individual instruction each quarter. Non-music and non-musical theatre majors are assessed an extra fee for individual lessons, and the availability of these lessons is dependent upon the schedule and load of the instructor involved. Generally, one half hour of individual instruction is given for each hour of credit taken.

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## **Subject - Applied Music and Performance (AMUS)**

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### **010 - VOICE CLASS**

*1.00 Credit*

### **015 - VOICE-INDIVIDUAL**

*1.00 to 3.00 Credits*

### **016 - MUSICAL THEATRE VOICE**

*1.00 Credit*

A basic voice class with a focus on musical theatre singing styles. Preparatory course for students who intend to audition for the musical theatre concentration.

### **020 - PIANO CLASS**

*1.00 Credit*

### **021 - PIANO CLASS-MAJORS**

*1.00 Credit*

### **025 - PIANO-INDIVIDUAL**

*1.00 to 3.00 Credits*

Special requirements for music majors are included in the course syllabus.

### **026 - HARPSICHORD-INDIVIDUAL**

*1.00 to 3.00 Credits*

### **030 - ORGAN CLASS**

*1.00 Credit*

### **035 - ORGAN-INDIVIDUAL**

*1.00 to 3.00 Credits*

### **040 - STRINGS CLASS**

*1.00 Credit*

### **041 - VIOLIN-VIOLA CLASS**

*1.00 Credit*

### **042 - CELLO-BASS CLASS**

*1.00 Credit*

### **043 - CLASSROOM INSTRUMENTS**

*1.00 Credit*

### **045 - VIOLIN-INDIVIDUAL**

*1.00 to 3.00 Credits*

### **046 - VIOLA-INDIVIDUAL**

*1.00 to 3.00 Credits*

### **047 - CELLO-INDIVIDUAL**

*1.00 to 3.00 Credits*

### **048 - DOUBLE BASS-INDIVIDUAL**

*1.00 to 3.00 Credits*

### **049 - GUITAR-INDIVIDUAL**

*1.00 to 3.00 Credits*

Special requirements for music majors are included in the course syllabus.

**050 - WOODWIND CLASS***1.00 Credit***055 - FLUTE-INDIVIDUAL***1.00 to 3.00 Credits***056 - OBOE-INDIVIDUAL***1.00 to 3.00 Credits***057 - CLARINET-INDIVIDUAL***1.00 to 3.00 Credits***058 - BASSOON-INDIVIDUAL***1.00 to 3.00 Credits***059 - SAXOPHONE-INDIVIDUAL***1.00 to 3.00 Credits***060 - BRASS CLASS***1.00 Credit***065 - TRUMPET-INDIVIDUAL****1.00 to 3.00 Credits****066 - FRENCH HORN-INDIVIDUAL***1.00 to 3.00 Credits***067 - TROMBONE-INDIVIDUAL***1.00 to 3.00 Credits***068 - EUPHONIUM-INDIVIDUAL***1.00 to 3.00 Credits***069 - TUBA-INDIVIDUAL***1.00 to 3.00 Credits***070 - PERCUSSION CLASS***1.00 Credit***075 - PERCUSSION-INDIVIDUAL***1.00 to 3.00 Credits*

## Music Performing Groups

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

***May be repeated on an unlimited basis by music majors, other students must check with their college Dean for specific college requirements.***

**080 - CHORUS***1.00 Credit*

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

**081 - CHAPEL CHOIR***1.00 Credit*

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

**082 - ADDED ATTRACTION***1.00 Credit*

Select show choir of singer/dancers performing characteristic literature including Broadway, pop, vocal jazz and country-western. Performances include concerts on and off campus. Membership by audition.

**083 - UNIVERSITY SINGERS***1.00 Credit*

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

**084 - WIND ENSEMBLE***1.00 Credit*

A concert ensemble open to qualified students who play band instruments. A wide variety of band literature is studied and performed in regular campus concerts. Membership by audition.

**085 - MEN'S CHORUS***1.00 Credit*

A choral ensemble performing outstanding choral literature written and arranged for male voices. In addition to the wide variety of sacred and secular music, the choir will combine with other university choruses to perform major choral works. A choral group open to all qualified students.

**086 - PEP BAND***1.00 Credit*

A band specially organized to provide music for athletic events.

**087 - SYMPHONIC BAND***1.00 Credit*

A fully-instrumented concert ensemble studying and performing the finest band literature with the highest musical standards. Performances include concerts and programs on campus and tour concerts.

**088 - JAZZ ENSEMBLE***1.00 Credit*

Selected ensembles for the study and performance of jazz and popular music. Performances on and off campus are scheduled throughout the year. Membership is by audition and/or permission of instructor. Priority is given to members of symphonic band and wind ensemble.

### **089 - OPERA WORKSHOP**

*1.00 to 3.00 Credits*

Instruction and experience in preparation for opera performance, including study of operatic literature and coaching of singers for specific roles in public performance of opera scenes and/or full staged operas. Prerequisite: Approval of the instructor or audition.

### **090 - MARCHING BAND**

*1.00 Credit*

The preparation and performance of football game shows at home and selected away games. Open to all university students who play band instruments or who are accepted for auxiliary groups. Fall Quarter only. Includes a drill camp in advance of the Fall Quarter.

### **091 - CHAPEL BAND**

*1.00 Credit*

Select ensemble of musicians devoted to the preparation and performance of contemporary instrumental and/or vocal music suitable for a university chapel service.

### **092 - WOODWIND ENSEMBLE**

*1.00 Credit*

Selected ensembles of woodwind instrumentalists for the study and performance of characteristic literature.

### **093 - WOMEN'S CHORUS**

*1.00 Credit*

A choral ensemble performing outstanding choral literature written and arranged for female voices. In addition to the wide variety of sacred and secular music, the chorus will combine with other university choruses to perform major choral works. A choral group open to all qualified students.

### **094 - BRASS ENSEMBLE**

*1.00 Credit*

Selected ensembles of brass instrumentalists for the study and performance of characteristic literature.

### **095 - PERCUSSION ENSEMBLE**

*1.00 Credit*

Selected ensembles of percussionists for the study and performance of characteristic literature.

### **096 - SYMPHONY ORCHESTRA**

*1.00 Credit*

Credit may be earned for membership by audition in the ONU Symphony and for orchestras on campus which perform for large choral works and musical theatre productions. Permission of instructor is required.

### **097 - NORTHERNAIRES**

*1.00 Credit*

A highly select vocal jazz quartet with backup instrumental ensemble performing a wide variety of representative music. Performances include concerts both on and off campus. Membership by audition.

### **098 - STRING ENSEMBLE**

*1.00 Credit*

Ensembles of string instrumentalists for the study and performance of characteristic literature.

### **099 - NEW MUSIC ENSEMBLE**

*1.00 Credit*

The rehearsal and performance of solo, chamber, and small ensemble music from the twentieth century. In addition, significant experimental music from previous centuries will be included. Emphasis will be on landmark works by major composers, and post-1960 music. Permission of the instructor.

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## **Subject - Music (MUSC)**

### **000 - ORIENTATION**

*1.00 Credit*

Familiarization with the department, departmental technology, requirements for majors, planning programs of courses, university catalog and library. Required of departmental majors. Graded S/U.

### **001 - CONCERT AND RECITAL OBSERVATION**

*.00 Credits*

A required number of concerts and recitals to be attended each quarter. Required of all full-time music majors. Graded S/U.

### **100 - MUSIC**

*4.00 Credits*

The nature, forms, styles and media of music of all types and periods. Emphasis upon listening and understanding. Laboratory listening and concert attendance, knowledge of fundamentals, recognition of composers and representative literature expected.

### **101 - MUSIC - MAJORS**

*3.00 Credits*

A basic music course for music majors only.

### **110 - FUNDAMENTALS OF MUSIC FOR THE NON-MUSIC MAJOR**

*4.00 Credits*

Basic components of music. The perception and reading of musical symbols. Includes listening experiences of representative literature and recognition of major composers.



### **121 - THEORY OF MUSIC 1**

*3.00 Credits*

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

### **122 - THEORY OF MUSIC 2**

*3.00 Credits*

Continuation of MUSC 121.

### **123 - THEORY OF MUSIC 3**

*3.00 Credits*

Continuation of MUSC 122.

### **131 - EAR TRAINING 1**

*1.00 Credit*

Sight-singing; melodic, rhythmic and harmonic dictation; keyboard harmony; conducting; improvisation taught in a laboratory setting. Supplemental and taken in conjunction with first year of music theory studies. Level determined by proficiency.

### **132 - EAR TRAINING 2**

*1.00 Credit*

Continuation of MUSC 131.

### **133 - EAR TRAINING 3**

*1.00 Credit*

Continuation of MUSC 132.

### **190 - SPECIAL TOPICS IN MUSIC**

*1.00 to 4.00 Credits*

### **200 - NON-WESTERN MUSIC**

*4.00 Credits*

The fundamental concepts of music in any culture with an in-depth exploration of the music of a limited number of non-Western groups. Emphasis on listening and understanding.

### **210 - JAZZ HISTORY AND LITERATURE**

*3.00 Credits*

Modern jazz, from its roots in African tribal music through the gradual evolution of this American art form as it appears today.

### **211 - ELECTRONIC MUSIC**

*2.00 Credits*

History, development, materials, and techniques of electronic music. Emphasis on composition in the medium. Concentration of classical (tape recorder) techniques and use of synthesizer. Work in the electronic laboratory. May be repeated on an unlimited basis by music majors. Prerequisite: Permission of the instructor.

### **221 - ADVANCED THEORY OF MUSIC 1**

*3.00 Credits*

Continuation of MUSC123. Study of 18th, 19th and 20th century compositional techniques, orchestration, and counterpoint. Development of analytical skills. Creative projects in composition using computers and other technology at various times throughout the sequence. Continuation courses must be taken in sequence. Prerequisite: MUSC 123.

### **222 - ADVANCED THEORY OF MUSIC 2**

*3.00 Credits*

Continuation of MUSC 221.

### **223 - ADVANCED THEORY OF MUSIC 3**

*3.00 Credits*

Continuation of MUSC 222.

### **231 - ADVANCED EAR TRAINING 1**

*1.00 Credit*

Continuation of MUSC 131, 132 and 133. Supplemental and taken in conjunction with second year of music theory. Elements of traditional improvisation included in the keyboard harmony portion.

### **232 - ADVANCED EAR TRAINING 2**

*1.00 Credit*

Continuation of MUSC 231.

### **233 - ADVANCED EAR TRAINING 3**

*1.00 Credit*

Continuation of MUSC 232.

### **241 - BASIC CONDUCTING**

*2.00 Credits*

General conducting techniques and principles of score study. Laboratory experiences. Continuation courses must be taken in sequence. Prerequisite: MUSC 121.

### **261 - LATIN AND ITALIAN DICTION FOR SINGERS**

*1.00 Credit*

The proper pronunciation of vocal and choral texts in Latin and Italian. Required of all vocal music majors.

### **262 - FRENCH DICTION FOR SINGERS**

*1.00 Credit*

Continuation of MUSC 261 in French.

### **263 - GERMAN DICTION FOR SINGERS**

*1.00 Credit*

Continuation of MUSC 262 in German.

### **270 - INTRODUCTION TO THE MUSIC INDUSTRY**

*3.00 Credits*

The various elements of the music industry - retailing, marketing, arts management, publishing, manufacturing, recording, unions and licensing. Prerequisite: MUSC 100.

### **280 - PIANO PROFICIENCY**

*.00 Credits*

**281 - GUITAR PROFICIENCY**

*.00 Credits*

**290 - SPECIAL TOPICS IN MUSIC**

*1.00 to 4.00 Credits*

**310 - AMERICAN MUSIC**

*4.00 Credits*

Sacred and secular American music from colonial America to the present with particular attention to native art music and the incorporation of jazz into symphonic and stage works of the twentieth century.

**311 - COUNTERPOINT**

*2.00 Credits*

Polyphonic music in various styles with particular emphasis on that of the eighteenth century. Creative projects in contrapuntal writing. Prerequisite: MUSC 223.

**312 - FORM AND ANALYSIS**

*2.00 Credits*

Musical forms and styles from the Baroque to the present. Theoretical and stylistic analysis of representative music. Prerequisite: MUSC 223.

**313 - ORCHESTRATION**

*2.00 Credits*

The instruments of the band and orchestra. Arrangements for the band and orchestra. Arrangements for string, woodwind and brass combinations. Orchestrations by classical, romantic, and modern composers. Prerequisite: MUSC 223.

**314 - MUSIC COMPOSITION**

*3.00 Credits*

Principles general to all compositional styles, and application of these principles through weekly composition projects. Includes work in the electronic music laboratory. In class performances. May be repeated on an unlimited basis by music majors. Prerequisite: Permission of the instructor.

**321 - MUSIC HISTORY AND LITERATURE 1**

*3.00 Credits*

The historical development of music literature. Representative literature and composers: Ancient, Medieval and Renaissance periods. Prerequisite: MUSC 100.

**322 - MUSIC HISTORY AND LITERATURE 2**

*3.00 Credits*

Baroque and Classical periods. Prerequisite: MUSC 100.

**323 - MUSIC HISTORY AND LITERATURE 3**

*3.00 Credits*

Romantic and Twentieth Century periods. Prerequisite: MUSC 100.

**334 - WOODWIND METHODS**

*2.00 Credits*

Study, elementary performance skills, pedagogy, and materials of the woodwind instruments. For future school music teachers.

**336 - BRASS METHODS**

*2.00 Credits*

Study, elementary performance skills, pedagogy, and materials of the brass instruments. For future school music teachers.

**338 - PERCUSSION METHODS**

*2.00 Credits*

Study, elementary performance skills, pedagogy, and materials of the percussion instruments. For future school music teachers.

**339 - STRING METHODS**

*2.00 Credits*

Study, elementary performance skills, pedagogy, and materials of the orchestral stringed instruments. For future school music teachers.

**342 - ADVANCED CONDUCTING - INSTRUMENTAL**

*2.00 Credits*

Further development of baton techniques and other conducting skills relating to practice, reading and preparation of scores for working with instrumental ensembles. (Formerly MUSC 242). Prerequisite: MUSC 241.

**343 - ADVANCED CONDUCTING - CHORAL**

*2.00 Credits*

Adaptation of basic conducting techniques to the choral ensemble, including leadership, error detection, tonal development, stylistic accuracy and analysis. Exploration of choral philosophy and development. (Formerly MUSC 341.) Prerequisite: MUSC 241.

**371 - APPLIED FIELD LITERATURE-PEDAGOGY 1**

*1.00 Credit*

Study of the professional and educational literature in a specific applied field.

**372 - APPLIED FIELD LITERATURE-PEDAGOGY 2**

*1.00 Credit*

Continuation of MUSC 371.

**373 - APPLIED FIELD LITERATURE-PEDAGOGY 3**

*1.00 Credit*

Continuation of MUSC 372.

**380 - JUNIOR RECITAL**

*.00 Credits*

Recital hearing must be passed before approval is granted for performance. Graded S/U.

**390 - SPECIAL TOPICS IN MUSIC**

*1.00 to 4.00 Credits*

**411 - ADVANCED ELECTRONIC MUSIC COMPOSITION**

*2.00 Credits*

Study and creative work in the area of electronic music. Focuses upon advanced synthesis, recording and notational techniques as they relate to creative efforts. Relevant historical topics and a survey of the electronic music literature will be included. May be repeated on an unlimited basis by music majors.

**461 - SECONDARY CHORAL METHODS AND TECHNIQUES***3.00 Credits*

Procedures in the development and direction of school choral groups, including choral literature of all types. Includes laboratory experience in teaching vocal techniques in the approximately 20 hours of field experience. Prerequisite: Admission to Teacher Education Program.

**462 - SECONDARY INSTRUMENTAL METHODS AND TECHNIQUES***3.00 Credits*

Procedures in the development and direction of school bands and orchestras, including band literature of all types. Includes laboratory experience in teaching beginning instrumental students individually, in small groups and larger classes in the approximately 20 hours of field experience. Prerequisite: Admission to the Teacher Education Program.

**463 - MARCHING BAND METHODS AND TECHNIQUES***2.00 Credits*

Methods, materials, and techniques in the development and direction of the marching band. Show planning, precision drill, rehearsal techniques, experience with the latest technology, and selection and rehearsal of music. Membership in Marching Band required in conjunction with the class. Includes approximately 8 hours of field experience.

**470 - INTERNSHIP IN MUSIC BUSINESS***3.00 Credits*

Professional experience in one area of music business. Application of classroom theory to practice through working in an outside organization or business. Can not be repeated for additional credit. Prerequisites: Completion of all business-related course work and permission of the department chair.

**480 - SENIOR RECITAL***.00 Credits*

Recital hearing must be passed before approval is granted for performance. Graded S/U.

**490 - SPECIAL TOPICS IN MUSIC***1.00 to 4.00 Credits*

Group study of approved specialized topics not offered in catalog.

**497 - INDEPENDENT STUDY IN MUSIC***1.00 to 4.00 Credits*

A wide variety of specialized musical subjects are available through individual study with a faculty member.





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## DEPARTMENT OF PHILOSOPHY AND RELIGION

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Professor Beanblossom; Associate Professors P. Croskery, Morrison, Person (*Chair*); Assistant Professor Katayama; Visiting Assistant Professor Stauber

### Mission Statement

The Department of Philosophy and Religion's purpose is to help all Ohio Northern students develop into "mature men and women capable of clear and logical thinking and sensitive to the higher values of truth, beauty and goodness." This development is to occur within a curriculum that introduces and critiques both the Judeo-Christian tradition and various other religious and philosophical traditions. The minors in philosophy and religion provide all students with opportunities to explore philosophical and religious traditions in more depth and the majors in philosophy and religion also offer rigorous preparation for students who wish to pursue graduate and professional studies.

**General Education Requirements** in philosophy or in religion may be met by any course offered in the appropriate discipline (except for Philosophy 234 which does not count toward the philosophy requirement; except for Religion 271, 272, 281, and 282 which do not count toward the religion requirement). 100-level courses are available to all students. 200-level courses require at least sophomore standing or consent of the instructor, and 300- or 400-level courses require at least junior standing or consent of the instructor.

**Philosophy Major** The major in philosophy requires a minimum of 44 hours beyond PHIL 100, including the following courses: 234; two of the following (237, 238, 340); the two courses in the history of philosophy sequence (102, 202); and either 480 or 483. With departmental approval, a maximum of three courses in religion may be applied to the philosophy major.

**Philosophy Major with prelaw emphasis** The major in philosophy with a prelaw emphasis includes all of the requirements for the philosophy major with the following core courses for prelaw students: PHIL 234, PHIL 238, and PHIL 320 or PHIL 351.

**Philosophy Minor** The minor in philosophy requires a minimum of 28 hours in philosophy, including 234 and two of the following (102, 202, 237, 340).

**Philosophy Minor with prelaw emphasis** A minor in philosophy with a prelaw emphasis includes all of the requirements for the philosophy minor with the following core courses for prelaw students: PHIL 234, PHIL 238, and PHIL 320 or PHIL 351.

**Religion Major** The major in religion requires a minimum of 44 hours, including the following courses: either 105 or 107; either 109 or 110; either 241 or 264; 325; two additional courses in biblical studies; at least one course in the history of Christian thought (310, 311 or 312); and either 481 or 484. (No more than 12 hours of 100-level courses in religion may count toward the major.) With departmental approval, a maximum of three courses in philosophy may be applied to the religion major.

**Religion Minor** The minor in religion requires a minimum of 28 hours in religion, including 105 or 107 and 109 or 110. No more than 12 hours of 100-level courses in religion may count toward the minor.

**Philosophy and Religion Major** The major in philosophy and religion requires a minimum of 44 hours. Selection of courses is subject to approval by the department and must include 480 or 481 or else 483 or 484.

**Youth Ministry Major** The major in youth ministry requires a total of 80 hours (56 hours in religion and 24 hours in cognate subjects) as follows: in religion, 105 or 107, 108, 109 or 110, 241 or 264, 263, 325, two additional courses in Bible, two courses in the history of Christian thought (310, 311, 312), 253, 453, 4 hours of 410, 481 or 484; in cognate fields, PSYC 100, SOC 105, EDUC 223, EDUC 224, ENGL 225, and SOC 240.

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

**Prelaw Program** The department cooperates with the Pettit College of Law in the "guaranteed admission" prelaw program (see elsewhere in this catalog). Information about the curricular requirements of the program can be secured from the department chair.

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

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## Philosophy

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

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

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### **Subject - Philosophy (PHIL)**

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#### **000 - ORIENTATION**

*1.00 Credit*

Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Graded S/U.

#### **100 - INTRODUCTION TO PHILOSOPHY**

*4.00 Credits*

Philosophical inquiry, its scope and methodology, through a study of representative philosophical problems such as the nature of ethical values, principles of correct reasoning, the possibility and limits of knowledge, and the distinction between appearance and reality.

#### **102 - GREAT MODERN PHILOSOPHERS**

*4.00 Credits*

Philosophical inquiry, its scope, methodology, and persistent problems through a study of major modern philosophers from Bacon to James.

#### **190 - SPECIAL TOPICS IN PHILOSOPHY**

*1.00 to 4.00 Credits*

May be repeated for credit, depending on content.

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PREREQUISITE FOR THE COURSES BELOW:  
ONE COURSE IN PHILOSOPHY; OR SOPHOMORE STANDING (FOR 200-LEVEL COURSES); OR AT LEAST JUNIOR STANDING (FOR 300 OR 400-LEVEL COURSES); OR CONSENT OF INSTRUCTOR.

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#### **202 - PLATO AND ARISTOTLE**

*4.00 Credits*

The Greek philosophers Plato and Aristotle, against the background of the Pre-Socratics and Socrates. (Formerly PHIL 331)

#### **234 - LOGIC**

*4.00 Credits*

Logical fallacies and the principles of correct reasoning. The application of formal logical analysis to arguments encountered in ordinary language. WILL NOT SATISFY THE GENERAL EDUCATION REQUIREMENT IN PHILOSOPHY.

#### **237 - KNOWLEDGE AND TRUTH**

*4.00 Credits*

The scope and justification of knowledge with reference to problems such as skepticism, sense perception, reason, belief, and truth.

#### **238 - ETHICS**

*4.00 Credits*

Selected ethical theories and their rational justification. The use of ethical theories for resolving ethical issues in personal and social decision-making.

#### **290 - SPECIAL TOPICS IN PHILOSOPHY**

*1.00 to 4.00 Credits*

May be repeated for credit, depending on content.

#### **310 - ENVIRONMENTAL ETHICS**

*4.00 Credits*

Theories of value, with special emphasis on the possible justification of extending the moral community to include non-human nature. Foci will include future generations, pollution, the commons, "jobs vs. wilderness" and legal and moral rights.

#### **320 - SOCIAL JUSTICE**

*4.00 Credits*

Theories of justice in contemporary society, including conceptions of the law, human rights, equality, liberty, and responsibility.

#### **325 - PHILOSOPHY OF RELIGION**

*4.00 Credits*

Critical inquiry into issues such as the nature and existence of God, the problem of evil, the significance of religious experience, the justification of religious belief, and the relation of faith and reason. (Also listed as RELG 325)

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### **336 - ETHICS IN PROFESSIONAL LIFE**

#### *4.00 Credits*

Ethical behavior with emphases on ethical theories and their rational justification, on such problems as relativism and why be moral, and on resolving issues as they arise in case studies from engineering, business, and health care.

### **340 - THEORIES OF BEING**

#### *4.00 Credits*

Theories of being with reference to problems such as reality, existence, essence, nature, and their implications for knowledge and values.

### **341 - AESTHETICS**

#### *4.00 Credits*

Classical and contemporary theories of art and aesthetic experience. Consideration of the nature of various arts and of issues such as meaning, truth, and value in art.

### **351 - PHILOSOPHY OF LAW**

#### *4.00 Credits*

The major philosophical theories of law, from legal positivism to critical legal studies. Examination of areas of the law such as criminal law, contract law and constitutional interpretation. Topics include, but are not limited to, free speech, the insanity defense, and surrogate mother contracts. Prerequisites: PHIL 100 or 102 and one 200-or 300-level philosophy class.

### **390 - SPECIAL TOPICS IN PHILOSOPHY**

#### *1.00 to 4.00 Credits*

May be repeated for credit, depending on content.

### **480 - PHILOSOPHY SENIOR ESSAY**

#### *4.00 Credits*

A critical essay on a topic selected in consultation with a faculty advisor. Enrollment in the quarter during which the paper is to be completed. However, preliminary work on this project commences no later than the beginning of the senior year. (For majors only.)

### **483 - PHILOSOPHY SENIOR HONORS ESSAY**

#### *4.00 Credits*

Open to students with at least a 3.5 cumulative GPA in their Philosophy or Philosophy and Religion major. Enrollment in the quarter during which a critical essay is to be completed on a topic selected in consultation with a faculty advisor. However, preliminary work on this project commences no later than the beginning of the senior year.

### **497 - INDEPENDENT STUDY IN PHILOSOPHY**

#### *1.00 to 4.00 Credits*

Departmental permission required. May be repeated for credit, depending on content.

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## **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.

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### **Subject - Religion (RELG)**

#### **000 - ORIENTATION**

##### *1.00 Credit*

Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Graded S/U.

#### **105 - RELIGION IN HUMAN LIFE**

##### *4.00 Credits*

The religious dimension of the human search for personal identity, meaningful existence, and ultimate reality, through the examination of various aspects and expressions of the religious life of humanity.

#### **107 - RELIGIONS EAST AND WEST**

##### *4.00 Credits*

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**

##### *4.00 Credits*

The major teachings, practices and institutional forms of Christianity in their historical and contemporary settings.

#### **109 - INTRODUCTION TO THE OLD TESTAMENT**

##### *4.00 Credits*

Critical reading of the Old Testament (the Hebrew Bible): its historical background, literary features, and theological claims.

## **110 - INTRODUCTION TO THE NEW TESTAMENT**

*4.00 Credits*

Critical reading of the New Testament: its historical background, literary features, and theological claims.

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PREREQUISITE FOR THE COURSES BELOW: ONE COURSE IN RELIGION; OR SOPHOMORE STANDING (FOR 200-LEVEL COURSES); OR AT LEAST JUNIOR STANDING (FOR 300 OR 400-LEVEL COURSES); OR CONSENT OF INSTRUCTOR.

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## **210 - WOMEN IN THE BIBLE**

*4.00 Credits*

The portrayal of women in the Old and New Testaments with secondary readings of feminist theory.

## **231 - RELIGIOUS EXPERIENCE**

*4.00 Credits*

A comparative exploration of diverse encounters with the sacred, as portrayed in literature from around the world. (Also counts as an English literature course.)

## **241 - ISLAM AND CHRISTIANITY**

*4.00 Credits*

The Islamic and Christian traditions, including the history, theology, and politics of each as well as an exploration of their interactions.

## **243 - THE BIBLE AND THE THIRD WORLD**

*4.00 Credits*

Reading interpretations by Third World authors to learn more about the Bible, the cultures of the Third World, and how one's social location affects one's interpretation of texts. Prerequisite: RELG 109 or RELG 110.

## **253 - YOUTH MINISTRY SETTINGS AND ISSUES**

*4.00 Credits*

Exploration of various settings for youth ministry, including weekly youth meetings, camps, mission trips, Sunday School, and community service. Offered alternate years. (For youth ministry majors only.)

## **263 - CHRISTIAN ETHICS**

*4.00 Credits*

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

## **264 - BUDDHISM**

*4.00 Credits*

The ideas and practices of the Buddhist tradition in East and Southeast Asia, as well as in the West with emphasis on the life and teaching of the Buddha and the growth of different forms of Buddhism.

## **271 - BIBLICAL HEBREW 1**

*3.00 Credits*

Biblical Hebrew with heavy emphasis on grammar and vocabulary. Offered on demand.

## **272 - BIBLICAL HEBREW 2**

*3.00 Credits*

Continuation of RELG 271. Offered on demand. Prerequisite: RELG 271.

## **273 - BIBLICAL HEBREW 3**

*3.00 Credits*

Biblical Hebrew with heavy emphasis on readings from the Hebrew Bible. Offered on demand. Prerequisite: RELG 272.

## **281 - HELLENISTIC GREEK 1**

*3.00 Credits*

Hellenistic Greek with heavy emphasis on grammar, and some readings from the Greek New Testament. Offered on demand.

## **282 - HELLENISTIC GREEK 2**

*3.00 Credits*

Hellenistic Greek with heavy emphasis on grammar, and readings from the Greek New Testament. Offered on demand. Prerequisite: RELG 281.

## **283 - HELLENISTIC GREEK 3**

*3.00 Credits*

Hellenistic Greek with heavy emphasis on grammar, and readings from the Greek New Testament and other early Christian literature. Offered on demand. Prerequisite: RELG 282.

## **291 - SPECIAL TOPICS IN RELIGION**

*1.00 to 4.00 Credits*

May be repeated for credit, depending on content.

## **310 - EARLY CHRISTIAN THOUGHT**

*4.00 Credits*

Christian history and theology from the formative period of the Church to the early Middle Ages. Diverse responses to cultural settings and efforts to formulate credal statements.



**311 - MEDIEVAL AND REFORMATION  
THOUGHT**

*4.00 Credits*

Church history and theology from the High Middle Ages to the beginning of the modern period. Philosophers, theologians, mystics and reformers.

**312 - NINETEENTH AND TWENTIETH  
CENTURY CHRISTIAN THOUGHT**

*4.00 Credits*

Church history and theology over the past 200 years. Representative thinkers and issues.

**320 - LIFE AND TEACHINGS OF ST. PAUL**

*4.00 Credits*

The insights of the most influential thinker and apostle in the early church.

**325 - PHILOSOPHY OF RELIGION**

*4.00 Credits*

Critical inquiry into issues such as the nature and existence of God, the problem of evil, the significance of religious experience, the justification of religious belief and the relation of faith and reason. (Also listed as PHIL 325.)

**363 - OLD TESTAMENT PROPHETS**

*4.00 Credits*

Critical examination of the prophetic books of the Old Testament from historical, literary, and theological perspectives.

**365 - JESUS AND THE GOSPELS**

*4.00 Credits*

Critical examination of the New Testament Gospels: their portrayals of Jesus, their theological perspectives, and their reliability as sources for the life of Jesus.

### 391 - SPECIAL TOPICS IN RELIGION

1.00 to 4.00 Credits

May be repeated for credit, depending on content.

### 410 - YOUTH MINISTRY INTERNSHIP

1.00 to 4.00 Credits

Internship in youth ministry in various possible settings: congregation, camp, mission trip, etc. Each credit hour requires 25 hours in internship. Prerequisites: Limited to majors in youth ministry and approved by the department before registration. (Formerly Church Vocations Internship)

### 453 - PRINCIPLES OF CHRISTIAN EDUCATION

4.00 Credits

The philosophy, theory, and current methods of Christian education. The relationship of Christian education to other areas of ministry (e.g., worship). Offered alternate years. Prerequisites: RELG 109 or 110, RELG 263, EDUC 223 or 224, and at least 1 hour of RELG 410.

### 481 - RELIGION SENIOR ESSAY

4.00 Credits

A critical essay on a topic selected in consultation with a faculty advisor. Enrollment in the quarter during which the paper is to be completed. However, preliminary work on this project commences no later than the beginning of the senior year. (For majors only.)

### 484 - RELIGION SENIOR HONORS ESSAY

4.00 Credits

Open to students with at least a 3.5 cumulative GPA in their Religion or Philosophy and Religion major. Enrollment in the quarter during which a critical essay is to be completed on a topic selected in consultation with a faculty advisor. However, preliminary work on this project commences no later than the beginning of the senior year.

### 498 - INDEPENDENT STUDY IN RELIGION

1.00 to 4.00 Credits

Departmental permission required. May be repeated for credit, depending on content.

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## DEPARTMENT OF PHYSICS AND ASTRONOMY

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Associate Professor Theisen (*Chair*); Assistant Professors Me. Caragiu, Pinkney, Sheridan

### Mission Statement

The primary aim of the department is to offer courses that will stimulate scientific thought, train the student to reason from fundamental experimental fact, further the student's desire to continue scientific investigation, and meet the needs of those students who are interested in physics for its cultural or vocational value. The department aims to give a training sufficiently broad perspective to enable the student to appreciate the physics of scientific articles; to teach physics in the public schools; to apply physics in engineering, medicine, and other sciences; and to pursue graduate work. Ohio Northern University offers the major in physics with both the bachelor of arts degree and the bachelor of science degree.

**Department Programs** Ohio Northern University offers the Physics Major in the traditional track and the modified track, the Physics Minor and the Astronomy Minor.

**Physics Major** The traditional track toward the physics major consists of 56 credit hours. The required courses are: Freshman Seminar or Orientation, PHYS 231, 232, 233, 234, 235, 236, 303, 345, 351, 352, 360, 411, 412, and four hours of the Advanced Laboratory, PHYS 300 (maximum 4 hours). Additionally, in consultation with the chair of the department, eight hours of Physics electives must be taken from the 300 level or above. Required cognate courses are MATH 163, 164, 165, 263, 272, 275 and ECCS 164. Students desiring graduate study in physics are also encouraged to take MATH 362 and 363.

A modified track toward the physics major consists of 45 credit hours. It is intended for students who are completing the requirements for a second program in addition to the physics major. Examples of this second program include a second major or minor or a program of courses leading to licensure for public school teaching. The required courses for the modified physics track are: PHYS 231 or 211, 232 or 212, 233 or 213, 234, 235, 236, 252 or 253, 303, 345, 351, 411, and two hours of the Advanced Laboratory, PHYS 300 (maximum 4 hours). Additionally, in consultation with the chair of the department, eight hours of physics electives must be taken from the 300 level or above. Required cognates are MATH 163, 164, 165 and *one* of the following: (i) CHEM 181, 182, 183, (ii) BIOL 121, 122, 123, (iii) ECCS164, 165, 166, (iv) completion of a major, minor, or option in another field.

**Physics Minor** The student desiring to complete the requirements for the physics minor must complete 31 credit hours. The required courses are PHYS 231,

232, 233, 234, 235, 236, 303, and three advanced courses in physics approved by the chair of the physics department. PHYS 211, 212, or 213 may be substituted respectively for PHYS 231, 232, or 233 with additional approved physics courses taken to complete the 31-hour requirement. Substitution of similar courses in other programs for physics courses is listed below.

**Astronomy Minor** The student desiring to complete the requirements for the astronomy minor must complete 31 credit hours. The required courses are PHYS 231, 232, 233, 234, 235, 236, 252, 253, 255, 256, 303, and 371. PHYS 211, 212, or 213 may be substituted respectively for PHYS 231, 232, or 233 with additional approved Physics courses taken to complete the 31-hour requirement.

**Teaching Licensure** The department also offers a program leading to licensure for teaching physics in the Ohio public schools. The secondary education program is nationally accredited by the National Science Teachers Association. The program is designed for the student whose goal is to teach physics in the high schools. Due to the nature of the programs permitted by the state of Ohio, the student will also obtain licensure to teach chemistry. Typically, the student will complete the modified track toward the physics major, a minor in chemistry, and a number of hours in the education department specified by state licensure requirements.

**Substitution of Courses** Substitution for courses specified in the physics major or physics minor may be made with the approval of the chair of the department of physics. Substituted courses may be either internal to the department of physics or external. A maximum of 4 external credit hours may be substituted provided a grade of C or better is earned in the corresponding course. Substitutions which may be allowed are GE 214 for PHYS 351, ECCS 331 for PHYS 411, or CHEM 343 for PHYS 432.

Some of the courses listed below contain material which is similar but treated at different levels. Consequently, credit for both Physics 211 and 231, or 212 and 232, or 213 and 233 cannot be given toward satisfying minimum program requirements. Further, the department chair, in consultation with the registrar and dean of the College of Arts and Sciences, will evaluate transcripts from students who transfer to Ohio Northern University with physics courses from other institutions. Suitable credit will be awarded as appropriate.

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## **Subject - Physics (PHYS)**

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### **000 - ORIENTATION**

#### *1.00 Credits*

Familiarization with the department, requirements for majors' programs, University catalog and library. Required of departmental majors. AASG 100, Freshman Seminar, may be used to satisfy this requirement. Graded S/U.

### **100 - PHYSICS**

#### *4.00 Credits*

Presentation of classical mechanics, heat, atomic and nuclear physics. Issues involving science and society will also be considered. Available for credit for non science majors in the College of Arts and Sciences, and students enrolled in the College of Business Administration. In special circumstances, others may enroll with permission of the department chair. Students may not receive credit for PHYS 100 or PHYS 110 after completion of either PHYS 211 or PHYS 231.

### **101 - PHYSICAL AND EARTH SCIENCES- EARLY & MIDDLE CHILDHOOD MAJORS**

#### *4.00 Credits*

The first of a three-term integrated sequence of physics, earth, and life science. The nature of matter and energy and of their interactions as an introduction to the fundamental principles comprising the disciplines of physics and chemistry. Science teaching methods will be included. For early childhood and middle childhood licenses only. Prerequisite: MATH 173.

### **110 - INTRODUCTION TO PHYSICS**

#### *4.00 Credits*

Mathematical expression of basic principles and numerical solution of problems chosen from mechanics, waves, heat, electricity, and magnetism. For students who have not had high school physics or who desire additional preparation for PHYS 231-232-233. DOES NOT SATISFY A GENERAL EDUCATION REQUIREMENT AND IT CANNOT BE USED TO SATISFY SPECIFIC DEPARTMENTAL OR PROGRAM REQUIREMENTS. Prerequisites: High school algebra, geometry and trigonometry. Students may not receive credit for PHYS 100 or PHYS 110 after completion of PHYS 211 or PHYS 231.

## **120 - PHYSICS WITH HEALTH SCIENCE APPLICATIONS**

### *4.00 Credits*

Selected basic physical principles and their application to health science. Topics include levers and torques, fluid dynamics, electrical conduction, magnetism, optics, and radiation. Offered every term. Prerequisite: High school physics.

## **211 - GENERAL PHYSICS: MECHANICS OF SOLIDS**

### *3.00 Credits*

Basic principles of Newtonian mechanics of solids. The corresponding laboratory is PHYS 234.

## **212 - GENERAL PHYSICS: SOUND, HEAT, AND LIGHT**

### *3.00 Credits*

Sound propagation, heat and heat transfer, and light propagation. The corresponding laboratory is PHYS 235. Prerequisite: PHYS 211 or 231.

## **213 - GENERAL PHYSICS: ELECTRICITY AND MAGNETISM**

### *3.00 Credits*

Electrical and magnetic phenomena. The corresponding laboratory is PHYS 236. Prerequisite: PHYS 211 or 231.

## **231 - PHYSICS: MECHANICS OF SOLIDS**

### *4.00 Credits*

Newtonian mechanics of solids employing the differential and integral calculus. The corresponding laboratory is PHYS 234. Prerequisite: MATH 161 or 163.

## **232 - PHYSICS: HEAT, SOUND, AND LIGHT**

### *4.00 Credits*

Sound propagation, heat transfer and light propagation. Differential and integral calculus are used. The corresponding laboratory is PHYS 235. Prerequisite: PHYS 231.

## **233 - PHYSICS: ELECTRICITY AND MAGNETISM**

### *4.00 Credits*

Electrical and magnetic phenomena. Differential and integral calculus are used. The corresponding laboratory is PHYS 236. Prerequisite: PHYS 231.

## **234 - PHYSICS LABORATORY: MECHANICS**

### *1.00 Credit*

Experiments in basic Newtonian mechanics. PHYS 211 or 231 should be taken concurrently, or instructor's permission must be obtained.

## **235 - PHYSICS LABORATORY: HEAT, SOUND, AND LIGHT**

### *1.00 Credit*

Experiments in heat, sound and light. PHYS 212 or 232 should be taken concurrently, or instructor's permission must be obtained.

## **236 - PHYSICS LABORATORY: ELECTRICITY AND MAGNETISM**

### *1.00 Credit*

Experiments with basic electrical and magnetic phenomena. PHYS 213 or 233 should be taken concurrently or instructor's permission must be obtained.

## **252 - EARTH SCIENCE AND PLANETARY ASTRONOMY**

### *4.00 Credits*

The history of astronomy, the tools of astronomy, basic earth science and an introduction to solar system science. This course was formerly named Astronomy.

## **253 - STELLAR AND GALACTIC ASTRONOMY**

### *4.00 Credits*

Structure, motions and evolution of stars, interstellar material, galaxies and the universe as a whole.

## **255 - PLANETARY ASTRONOMY LABORATORY**

### *1.00 Credit*

Laboratory and mathematical companion to PHYS 252.

## **256 - STELLAR AND GALACTIC ASTRONOMY LABORATORY**

### *1.00 Credit*

Laboratory and mathematical companion to PHYS 253.

## **290 - SPECIAL TOPICS IN PHYSICS**

### *1.00 to 4.00 Credits*

## **300 - ADVANCED PHYSICS LAB**

### *1.00 to 3.00 Credits*

Laboratory projects from Mechanics, Heat, Sound, Light, Nuclear, Solid State Physics chosen to help foster the interests at some intermediate or advanced level. Will substitute for courses PHYS 310, 320, 330 or 340, up to a maximum of 4 credit hours. Prerequisites: PHYS 213, or 233.

### **303 - MODERN PHYSICS**

*4.00 Credits*

Relativity, quantum and wave mechanics, atomic structure and absorption and emission processes. Prerequisite: PHYS 213 or 233.

### **345 - MATH METHODS IN PHYSICS**

*4.00 Credits*

Vector algebra, vector calculus in arbitrary coordinate systems, Fourier Analysis, contour integration in complex plane, special functions. Prerequisite: PHYS 213 or 233.

### **351 - ANALYTICAL MECHANICS 1**

*4.00 Credits*

Vector analysis, kinematics, conservative forces, planetary motion, pendulum, free and forced oscillations, coupled systems and normal coordinates, angular momentum, rigid bodies. Part of the physics major program and offered when needed. Prerequisite: PHYS 213 or 233.

### **352 - ANALYTICAL MECHANICS 2**

*4.00 Credits*

LaGrange equations, canonical formulation, principle of least action, normal coordinates, rigid bodies, special relativity, mathematical methods. Part of the Physics major program and offered when needed. Prerequisites: PHYS 351.

### **353 - NUCLEAR PHYSICS**

*4.00 Credits*

Nuclear radiation detection instruments, nuclear constituents and structure, nuclear models, nuclear reactions, fundamentals of nuclear reactor theory and design, shielding and safety principles in nuclear physics. Prerequisites: PHYS 213 or 231.

### **360 - QUANTUM MECHANICS**

*4.00 Credits*

Eigenvalues and eigenvectors, commutators, bra-ket notation, postulates of quantum theory, solution of the Schrodinger wave equation for square well potential, harmonic oscillator, hydrogen atom, and other potentials. Perturbation theory. Prerequisite: PHYS 213 or 233.



### **361 - ELECTRONICS**

#### *4.00 Credits*

Theory of solid state devices, rectifier circuits, transistor amplifiers, oscillators and modulators, instrumentation applications. Offered as needed. Prerequisites: PHYS 213 or 233.

### **364 - OPTICS**

#### *4.00 Credits*

The laws of geometrical and physical optics. Image formation by mirrors and lenses and optical aberrations. Interference and diffraction. Part of the physics major program and offered when needed. Prerequisites: PHYS 213 or 233. Formerly PHYS 363 and 463.

### **371 - INTRODUCTORY ASTROPHYSICS**

#### *4.00 Credits*

Motions and physical nature of objects in the solar system, electromagnetic radiation, telescopes and astronomical detectors. Prerequisites: PHYS 213 or 233, or permission of the instructor.

### **375 - PLASMA PHYSICS**

#### *4.00 Credits*

Single particle motions. Plasmas as fluids. Waves and wave formation in plasmas. Nonlinear effects in plasmas. Prerequisites: PHYS 213 or 233.

### **381 - COMPUTATIONAL PHYSICS**

#### *4.00 Credits*

Methods and problems in computational physics. Prerequisites: ECCS 461 and PHYS 345.

### **411 - ELECTRICITY AND MAGNETISM 1**

#### *4.00 Credits*

Electrostatic field theory, capacitance, multipole expansion, dielectric properties of matter; magnetic field theory; electromagnetic induction; magnetic properties of matter; Maxwell's equations and electromagnetic waves. Part of the Physics major program and offered when needed. Prerequisite: PHYS 233.

### **412 - ELECTRICITY AND MAGNETISM 2**

#### *4.00 Credits*

Advanced electric and magnetic fields; electric and magnetic properties of solids, electromagnetic radiation. Part of the Physics major program and offered when needed. Prerequisite: PHYS 411.

### **413 - SOLID STATE**

#### *4.00 Credits*

The structure of solids and their phenomena. Quantum and statistical mechanics concepts are introduced to develop theories of internal stress and strain in crystals, conductivity of electricity in metals, semiconductors and superconductors, magnetism, the thermal properties of solids and imperfections in solids. Part of the Physics major program and offered when needed. Prerequisite: PHYS 303.

### **432 - STATISTICAL PHYSICS**

#### *4.00 Credits*

Properties of gases, thermal properties of solids and liquids. Elementary thermodynamic laws and techniques. Heat transfer. Elements of kinetic thermodynamics laws and techniques. Part of the Physics major program and offered when needed. Prerequisite: PHYS 212 or 232.

### **490 - SPECIAL TOPICS IN PHYSICS**

#### *1.00 to 3.00 Credits*

Part of the Physics major program and offered when needed.

### **497 - INDEPENDENT STUDY**

#### *1.00 to 3.00 Credits*

Part of the Physics major program and offered when needed.

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## DEPARTMENT OF PSYCHOLOGY AND SOCIOLOGY

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Professor Cohoe; Associate Professors  
Durkin, Kauffman; Assistant Professor Shanahan;  
Visting Assistant Professor El-Hag

Wilson (*Division Chair*)

### Mission Statement

The objectives of the department are to develop within each student an understanding of human relationships, institutions, and social processes; familiarity with the nature and causes of social problems; acquaintance with the theories of behavior; ability to think more critically and to integrate insights for useful participation in community life; and preparation for advanced study in the individual's selected field.

### Prelaw with Psychology and Sociology

Study in the behavioral sciences provides an especially suitable background for prelaw students. The department, in cooperation with the College of Law at Ohio Northern University, offers a formal prelaw program with "guaranteed admission" to the law school. Detailed information appears on page 33 of this catalog.

**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 chair 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.

**Alpha Kappa Delta**, founded in 1920, is the International Sociology Honor Society. AKD is a "non-secret, democratic, international society of scholars dedicated to the ideal of *Anthropon Katamanthanein Diakonesian*" or "To investigate humanity for the purpose of service." The purpose of AKD is to "promote an interest in the study of sociology, research of social problems, and such other social and intellectual activities as will lead to improvement in the human condition."

**Psi Chi** is the national honor society in psychology, founded in 1929 for the purpose of encouraging, stimulating, and maintaining excellence in scholarship and advancing the science of psy-

chology. Membership in the society is selective and based on high academic performance.

**Psi Sigma** is a student organization open to all students with an interest in either psychology or sociology. The club sponsors field trips, speakers, and social activities.

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## Psychology

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

**"C" grade or better in all courses used to complete the major or minor. No substitutions of courses without the permission of the department chair.**

### Core

AASG 300 Job and Grad. School Search Techniques  
PSYC 000 Orientation  
PSYC 100 Psychology  
PSYC 210 Experimental Psychology 1  
PSYC 211 Experimental Psychology 2  
BIOL 121 General Biology  
STAT 142\* Intro. to Statistics

### Cognate Electives

BIOL 122 Intro. to Zoology  
BIOL 124 Intro. to Human Anatomy & Histology  
or  
STAT/MATH XXX  
TECH 139 Intro. to Information Systems  
or  
STAT/MATH XXX  
STAT/MATH XXX

### Electives:

32 hours of Psychology electives

### For the minor:

Psychology core

20 hours of Psychology electives

\*STAT 156-Biostatistics 1 is also acceptable for those students with sufficient Calculus background.

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## Subject - Psychology and Sociology (PSSC)

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### 301 - SOCIAL PSYCHOLOGY

#### 4.00 Credits

The effect of social and cultural forces upon the individual. The nature and development of attitudes, languages, cognitive processes. Individual and group projects illustrative of the methodology of social psychology. Prerequisite: PSYC 100.

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## **Subject - Psychology (PSYC)** —

### **000 - ORIENTATION**

*1.00 Credit*

Familiarization with the departmental requirements for majors, planning programs of courses, University catalog and library; career options. Graded S/U.

### **100 - PSYCHOLOGY**

*4.00 Credits*

General research and concepts in human behavior. Lectures, demonstrations, and observations.

### **210 - EXPERIMENTAL PSYCHOLOGY 1**

*4.00 Credits*

The logic of experimental research and the application of the methods of science to the study of behavior. Particular emphasis on framing empirically testable hypotheses, experimental design, and analysis of data. Taught through lecture, computer simulation, and actual research experience. Extensive instruction in scientific communication and the APA Publications Manual. Prerequisites: STAT 142 and PSYC 100.

### **211 - EXPERIMENTAL PSYCHOLOGY 2**

*4.00 Credits*

Continuation of PSYC 210.

### **212 - PRINCIPLES OF BEHAVIOR MANAGEMENT**

*4.00 Credits*

The theory and supporting research which underlie behavior modification. Taught through lecture and laboratory demonstrations. Prerequisite: PSYC 100.

### **215 - DEVELOPMENTAL PSYCHOLOGY**

*4.00 Credits*

Basic theories in human development from conception through old age; contemporary research at each age level. Prerequisite: PSYC 100.

### **218 - PSYCHOLOGY OF THE EXCEPTIONAL CHILD**

*4.00 Credits*

The atypical child. Diagnosis and treatment of disorders of infancy, childhood and adolescence. Prerequisite: PSYC 100.

### **226 - HUMAN SEXUAL BEHAVIOR**

*4.00 Credits*

Use of research literature in an attempt to provide an understanding of what is known (as well as what is not known) about the major facets of human sexual behavior. Prerequisite: PSYC 100.

### **290 - SPECIAL TOPICS IN PSYCHOLOGY**

*1.00 to 4.00 Credits*

### **311 - PSYCHOLOGY OF PERSONALITY**

*4.00 Credits*

The major theories of personality from Freud to contemporary theoretical approaches. Prerequisite: PSYC 100.

### **312 - PSYCHOLOGICAL ASSESSMENT**

*4.00 Credits*

Psychological measurement and evaluation in the areas of intelligence tests, tests of separate abilities, and personality inventories. Experience will be gained in test administration, scoring and interpretation. Prerequisite: PSYC 100.

### **315 - LEARNING THEORY AND RESEARCH**

*4.00 Credits*

The major theories of learning and major empirical issues and findings related to classical and instrumental conditioning. Current research in learning is covered on both the animal and human level. Prerequisite: PSYC 100.

### **320 - PSYCHOLOGY AND THE LAW**

*4.00 Credits*

A review of the role of the psychologist in civil commitment procedures, the insanity defense, patient's rights, the determination of competency, and testifying as an expert witness. An examination of: significant court cases involving psychology and the law, research in the areas of jury selection, eyewitness testimony and psychologists' licensing procedures. Prerequisite: PSYC 100.

### **335 - PHYSIOLOGICAL PSYCHOLOGY**

*4.00 Credits*

Psychology as a biological science. Physiological events underlying behavior, including sensory, neural, and glandular involvement in such topics as motivation, emotion, and learning. Prerequisite: PSYC 100 and BIOL 231 or 331.

### **390 - SPECIAL TOPICS IN PSYCHOLOGY**

*1.00 to 4.00 Credits*

### **394 - JUNIOR SEMINAR**

*1.00 Credit*

A professional preparation seminar for psychology majors. Discussion of career options, graduate school admissions, resume writing, placement services, GRE, practicum and other topics of importance in the senior year. Prerequisites: Junior status; only psychology majors.



## **420 - ABNORMAL PSYCHOLOGY**

### *4.00 Credits*

The development of a scientific approach to abnormal behavior. A review of the psychological, sociological, and biological factors related to the development of abnormal behavior. A review of the research of, the causal factors related to, and the diagnosis and treatment of mental disorders and mental retardation. Prerequisite: PSYC 100.

## **426 - PRACTICUM IN PSYCHOLOGY**

### *4.00 to 16.00 Credits*

A field experience in the area of psychology. Open to seniors. Only 8 credits may apply to the major. Prerequisite: Approval of chairman.

## **434 - HISTORY AND SYSTEMS OF PSYCHOLOGY**

### *4.00 Credits*

An overview of the major lines of thinking which have influenced the field of psychology beginning with ancient Greek philosopher-scientists to the twentieth century. Emphasis is given to theories of Empiricism, Associationism, and Scientific Materialism as well as twentieth century schools of psychological thought. Prerequisite: PSYC 100.

## **497 - INDEPENDENT STUDY IN PSYCHOLOGY**

### *1.00 to 4.00 Credits*

Prerequisite: Approval of chairman.

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## **Sociology**

### **Sociology major:**

AASG 300 Job and Grad. School Search Techniques  
SOC 000 Orientation  
SOC 105 Sociology  
ISR 253 Research Methods 1  
ISR 254 Research Methods 2\*  
SOC 446 Classical Social Theory  
SOC 447 Contemporary Social Theory  
PSSC 301 Social Psychology  
STAT 142\*\* Intro. to Statistics  
PHIL 100 Intro. to Philosophy  
24 hours of sociology electives

### **Sociology minor:**

SOC 105 Sociology  
ISR 253 Research Methods 1  
ISR 254 Research Methods 2\*  
SOC 446 or SOC 447  
PSSC 301 Social Psychology  
STAT 142\*\* Intro. to Statistics  
PHIL 100 Intro. to Philosophy  
16 hours of sociology courses, selected in consultation with a member of the sociology faculty.

**“C” grade or better in all courses used to complete the major or minor. No substitutions of courses without the permission of the department chair.**

\*ISR 254 can be waived for a Sociology major or minor who has taken 210 and 211.

\*\*STAT 156 Biostatistics 1 is also acceptable for those students with sufficient Calculus background.

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## **Subject - Sociology (SOC)**

### **000 - ORIENTATION**

#### *1.00 Credit*

Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Graded S/U.

### **105 - SOCIOLOGY**

#### *4.00 Credits*

The basic phenomena and processes of social life: culture, socialization, deviance, social institutions (family, polity, economy, education, religion, military), bureaucratization, social inequality, collective behavior, social movements, and population. Analysis of the interplay between the person and social groups.

### **240 - MARRIAGE AND FAMILY**

#### *4.00 Credits*

Historical, cross cultural, and analytical study of family with emphasis on ideology and the effects of social structures and agencies on family composition and roles. Prerequisite: SOC 105.

### **243 - SOCIAL DEVIANCE**

#### *4.00 Credits*

Sociological perspectives on the processes of individual and group deviance. An examination of how deviant behavior is defined, how the definitions are maintained, and how the violators are processed. Theory and research regarding specific classes of deviants are explored, and current public policy issues concerning deviants are discussed. Prerequisite: SOC 105.

### **247 - SOCIAL STRATIFICATION**

#### *4.00 Credits*

The origins, institutionalization and change of class, status, prestige, power, and other forms of social inequality with attention to the effects of stratification on the individual. Prerequisite: SOC 105. Offered odd years. Formerly titled Social Inequality.

### **250 - CULTURAL ANTHROPOLOGY**

#### *4.00 Credits*

The major concepts and principles of cultural anthropology, emphasizing the understanding of the total configuration and interrelationships of culture traits, complexes, and social relationships in a particular geographic environment and historical context. Prerequisite: SOC 105.

## **260 - SOCIAL PROBLEMS**

### *4.00 Credits*

Sociological perspectives on contemporary social problems including racism, sexism, suicide, poverty, homelessness, domestic violence. Problems in education, the medical institution, work, urbanization, and environmental destruction. Prerequisite: SOC 105.

## **261 - CRIMINOLOGY**

### *4.00 Credits*

The nature and extent of crime, development of criminological theory, major forms of criminal behavior, and society's attempts at prevention and control of crime. The major perspectives, issues and diverse concerns that characterize contemporary criminology are presented.

## **263 - VICTIMOLOGY**

### *4.00 Credits*

The history of victimology, patterns of victimization, the role of the victim in crime, the victim in the criminal justice system, (including jury perceptions of victims) victim assistance programs, and victim/offender reconciliation programs. Prerequisite: SOC 105.

## **291 - SPECIAL TOPICS IN SOCIOLOGY**

### *1.00 to 4.00 Credits*

## **302 - WEEKEND SEMINAR**

### *1.00 Credit*

A weekend seminar at the Metzger Nature Center, Bolon Hall. Topics include selected issues in rural sociology, e.g., rural poverty, crime, work and occupations in rural America. A Nature Center use fee is charged.

## **347 - RACE, CLASS, AND GENDER**

### *4.00 Credits*

Analysis of the structural interplay and social ramifications of race, social class, and gender. The course focuses on power relationships, intra and intergroup conflict, and minority relations. Prerequisite: SOC 105.

## **361 - DELINQUENCY AND JUVENILE JUSTICE**

### *4.00 Credits*

An analysis of competing theoretical approaches to the causes of delinquent behavior, and the study of the prevention, treatment, and control of delinquency. Procedures and major contemporary issues in Juvenile Justice are addressed. Prerequisite: SOC 105.

## **362 - OCCUPATIONAL CRIME AND DEVIANCE**

### *4.00 Credits*

The various forms of criminal and deviant behavior that occur in the occupational context. A discussion of the nature, extent, consequences, and strategies to control this behavior. Major theoretical perspectives on occupational crime and deviance are considered. Topics covered include: white-collar crime, organized crime, employee theft, career criminality, and workplace violence. Prerequisite: SOC 105.

## **391 - SPECIAL TOPICS IN SOCIOLOGY**

### *1.00 to 4.00 Credits*

## **446 - CLASSICAL SOCIAL THEORY**

### *4.00 Credits*

Traces sociological theorizing from sociology's historical origins. Major theorists covered include Marx, Durkheim, Weber, Simmel, Chicago School sociologists, Parsons, and classical feminist theorists. Emphasis is on building an understanding of the roots of contemporary social theory. Prerequisite: Junior status. Formerly titled Social Thought.

## **447 - CONTEMPORARY SOCIAL THEORY**

### *4.00 Credits*

The major sociological theories developed since 1960. An examination of the critical debates in contemporary social theory. Prerequisite: Junior status.

## **481 - SOCIOLOGY INTERNSHIP**

### *4.00 to 16.00 Credits*

Supervised placement in an agency which involves work experience related to sociology or criminology or work experience on a research project. Prerequisites: Junior status, 2.75 GPA, consent of instructor, and approval of Department Chairman.

## **488 - SENIOR CAPSTONE RESEARCH 1**

### *2.00 Credits*

Development of research topic and/or question, literature review, and outline of research project directed by faculty advisor. Student must enroll at least two quarters before graduation. Capstone Research does not count toward Sociology elective hours. Prerequisites: Senior status, sociology primary major, and permission of advisor.

## **489 - SENIOR CAPSTONE RESEARCH 2**

### *2.00 Credits*

Research design, data collection, data analysis, and writing of the research paper directed by faculty advisor. Student must enroll at least one quarter before graduation and must have completed Senior Capstone Research 1. Capstone Research does not count toward Sociology elective hours. Prerequisites: SOC 488, senior status, and sociology primary major.

## **498 - INDEPENDENT STUDY IN SOCIOLOGY**

### *1.00 to 4.00 Credits*

Prerequisite: Approval of chairman.

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## DEPARTMENT OF TECHNOLOGICAL STUDIES

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Professor Rouch (*Chair*); Assistant Professors Jao, Mativo, Nutter, Sirinterlikci

### Mission Statement

The mission of the department of technological studies is to graduate life-long learners that possess a high degree of technological literacy. Graduates of the program are able to effectively use, manage, and understand current and emerging technologies.

The course work comprising the curriculum in technology is designed to prepare students for careers in professional, technical fields throughout industry and education. The intent is to provide broad, foundational experiences in the technologies and applied sciences that comprise modern industrial-technical society. Carefully structured classroom and laboratory activities feature numerous operations and processes that promote realistic involvement with the construction, manufacturing, technical communications, energy, power, and transportation-related fields. Course work and associated laboratory assignments place emphasis on researching, designing, experimenting, fabricating, and managing.

Both the bachelor of science and the bachelor of arts degree options are available. The number of quarter hours in the major varies depending upon the career path selected. Those selecting the technology education teacher licensure route must complete all state and university requirements for licensure. Those selecting the technology/industrial management path must complete an option/minor comprised of a minimum of 28 hours in one of the following: advanced manufacturing, construction operations, multimedia design and development, design analysis, business, or a specially selected option/minor. The business option is outlined in the Arts and Sciences course overview.

The department offers two work experience programs for the industrial track student. The first is a one-quarter internship designed to give the student a ten-week real-world experience, which is completed during the normal four-year program. The other is a five-year co-op program in which the student completes four to six quarters of work experience, usually with the same company. The program is divided into two, 2 or 3-quarter experiences, one completed after the sophomore year and the other after the junior year. The student gains considerable experience and is able to help offset the cost of school.

The department has established articulation programs with several area community and technical colleges. Refer to a later section and the department chair for more details.

A minor in virtual simulation and another in technology content is available to students in other majors who wish to enter technology-related careers.

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

### Technology Major (industry track) (all TECH courses)

Orientation 000

Introduction to Technology 110

Introduction to Computer-Assisted Drafting 120

Metallic Materials and Process 1 130

Microcomputer Applications in Technology 140

Computer-Assisted Construction Design 221 or

Solid Modeling for Design 421

Computer-Assisted Product Design 223

Metallic Materials and Processes 2 230

Product Manufacturing 232

Introduction to Communication Technology 240

Fundamentals of Electricity/Electronics 261

Sophomore Seminar in Technology 294

PLC's and Industrial Robotics 332

CAD/CAM and Automation Systems 335

Construction Technology 350

Digital Electronics: Concepts and Applications 362

Manufacturing Management 412

Nonmetallic Materials and Processes 430

Energy and Transportation 460

Quality Assurance 470

Senior Seminar in Technology 494

Senior Project in Technology 495

Tour of American Industries 496

### Options/Minors (28 hours)

An option or minor is required of all technology-industrial bound students except those students who already possess an associate's degree on a 2+2 articulation program. The business option is outlined in the Arts and Sciences overview section. The departmental structured options to select from are as follows:

#### Construction Operations Option

This option is designed for students who are interested in a career in construction management and supervisory type positions. The curriculum includes courses in civil engineering, technology, and business management, along with a required internship or co-op experience. Positions that students may seek with this option includes project manager, bid estimator, construction designer, and other construction management-type positions.

TECH 221	Computer Aided Construction Design
TECH 350	Construction Technology
CE 203	Surveying
CE 414	Project Management
MGMT 333	Management/Organizational Behavior

ABUS 312	Business Law 1
MGMT 363	Human Resource Management
TECH 484	Internship in Technology (Construction Placement)

or TECH 380 (4 quarters of Professional Practice with a construction industry placement)

### Multimedia Design and Development Option

(Option is available to all majors). This option provides students with a core of courses in graphic design, web page applications, and computer programming. This will give students the tools they need to develop outstanding web pages and learn to meet customer needs. Possible positions with this option include webmaster, web designer, or web developer for the private and public sectors.

ECCS 133	Visual Basic or
ECCS 164	Programming 1
TECH 341	Photography (including digital photography)
TECH 342	Electronic Media Design & Dev. 1
TECH 343	Electronic Media Design & Dev. 2
ART 222	Graphic Design 1
ART 223	Graphic Design 2
ART 340	Graphic Design 3
COMM 130	Introduction to Public Relations

### Design Analysis Option

This option is designed for the Technology Major who wants to venture more into the mechanical and product design field with an understanding of engineering principles in statistics, dynamics, and strength of materials. Typical professional positions for this option include: product designer and tooling design.

GE 101	Fundamentals of Engineering
GE 102	Engineering Problem Solving and CAD
GE 113	Statics
MATH 163	Calculus 1
MATH 164	Calculus 2
GE 214	Dynamics
GE 223	Strength of Materials
PHYS 231	Physics: Mechanics of Solids & Fluids

**Advanced Manufacturing Option** (Not open to students who have a virtual simulation minor)

This option is designed to give students exposure to the advanced concepts of manufacturing operations. This includes courses in virtual

simulation, advanced robotics applications, solids modeling, rapid prototyping and computer programming. Students with this option typically seek careers in process design, simulation, automation programming, robotics programming, and industrial supervision/management.

ECCS 133	Visual Basic or
ECCS 164	Programming 1
TECH 321	Basics of Virtual Simulation
TECH 322	Virtual Simulation of Systems
TECH 342	Electronic Media Design & Dev. 1
TECH 421	Solid Modeling for Design
TECH 423	Virtual Sim. Production & Mgmt.
TECH 435	Advanced Robotics (2 times)

Alternative **minors** may be selected to match a given student's career goals. This decision is made in consultation with the department of technology.

### Internship

All technology-industrial track students (major or minor) are encouraged to complete 15 hours of Internship (TECH 484) in an industrial setting either during a summer or academic year. The arrangements are made through the department prior to the student's registration for the internship.

### Co-op

The co-op is a five-year school/work program designed to integrate classroom study with planned and supervised work experiences. Technology co-op students normally are employed in manufacturing, construction or other industry related companies in semi-professional capacities. The employment sessions begin during the summer after the sophomore year. The student contracts for a total of four to six quarters of co-op during which they enroll in TECH 380 (Professional Practice in Technology).

### Technology Minor (28 hours)

Students from other disciplines who desire to gain a basic introduction to industry may select a minor as follows (all TECH courses):  
 Metallic Materials and Processes I 130  
 Introduction to Computer-Assisted Drafting 120  
 Introduction to Communication Technology 240  
 PLC's and Industrial Robotics 332  
 Construction Technology 350  
 Electives (minimum of eight credit hours)  
 Selected from 140, 200, 221, 223, 231, 232, 261, 294, 335, 340, 342, 362, 412, 421, 430, 441, 460, 470, 490, 494, 495, 496, or 497.

### Virtual Simulation Minor

The Virtual Simulation Minor is designed to give Ohio Northern University students the opportunity to experience state-of-the-art automation, simulation, and animation procedures

that are becoming important supports for multiple disciplines. This minor is available to students with any major who want a concentration of course work in virtual simulation and animation concepts. The minor in Virtual Simulation is not open to students who have an Advanced Manufacturing Option.

ECCS 133	Visual Basic <i>or</i>
ECCS 164	Programming 1
STAT 142	Introduction to Statistics
TECH 321	Basics of Virtual Simulation
TECH 322	Virtual Simulation of Systems
TECH 342	Electronic Media Design & Dev.
TECH 423	Virtual Sim. Production & Mngmt.
MATH 122, 162	
163, or 164	(Choose one)

### Capstone Experience

The purpose of the senior capstone experience is to foster individual research and the application of technical knowledge gained in the technology course work to solve technical problems. This includes following procedures in planning, scheduling, researching and developing, testing, fabricating, assembling, and evaluating designs.

Alternatives to the traditional senior project requirement for fulfillment of the Senior Capstone experience are as follows:

- 4 quarters of Co-op (TECH 380)
- 2 quarters of Robotics Team
- Internship 5 or 15 hrs.
- Student Teaching
- SME certification

### Articulation Programs

The department has developed articulation programs with several northwest Ohio community and technical colleges. These programs allow students who have completed associate degrees in technical areas to transfer to the technology program and usually complete the bachelor's degree in two full-time years or four years of part-time attendance. Consult the department chair for details.

### Technology Education Major Requirements (Leading to Technology Education Teacher Licensure, Grades 4-12):

TECH 000	Orientation
TECH 110	Introduction to Technology
TECH 120	Introduction to Computer Aided Drafting
TECH 130	Metallic Materials and Processes 1
TECH 140	Microcomputer Applications in Technology
TECH 221	Computer Assisted Constr. Des.
TECH 223	Computer Assisted Product Design
TECH 230	Metallic Materials and Processes 2
TECH 232	Product Manufacturing

TECH 240	Intro to Communication Technology
TECH 261	Fundamentals of Electricity and Electronics
TECH 294	Sophomore Seminar in Technology
TECH 332	PLC's and Industrial Robotics
TECH 335	CAD/CAM and Automation Systems
TECH 350	Construction Technology
TECH 430	Non-metallic materials and Processes
TECH 460	Energy and Transportation
TECH 491	Student Teaching Seminar in Technology
TECH 494	Senior Seminar in Technology
TECH 495	Senior Project in Technology (I to 3 hours)
TECH 496	Tour of American Industries

### Department of Education Requirements:

EDUC 115	Culture and Schooling
EDUC 150	Five Day Field Experience
EDUC 150	Five Day Field Experience
EDUC 210	Exceptional Learner
EDUC 285	Curriculum
EDUC 304	Strategies for Technology Education
EDUC 342	Reading in the Content Area
EDUC 445	Organization and Administration of Schools
EDUC 458	Organization and Methods of Teaching Technology
EDUC 475	Student Teaching Seminar
EDUC 470	Student Teaching
EDUC 480	Student Teaching

### Notes:

- Students must be admitted to teacher education to take 300 level and above education (EDUC) courses.
- Students must have 300 hours of course related field experience
- Graduates of the program must attain a passing score on Praxis for Teacher Licensure

### Technical Electives - All Majors

There are several technical courses offered by the department, which may be selected by students to add greater depth. These include (all TECH courses):

Technology and Society 200
Construction Design 221
Custom Woodworking 231
Product Manufacturing 232
Basics of Virtual Simulation 321
Photography 341
Electronic Media Design & Development 342
Solid Modeling for Design 421

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## **Subject - Technology (TECH)**

### **000 - ORIENTATION**

1.00 Credit

An introduction to the department, introduction to college life. Familiarization with the basic curriculum options. Planning a course program. University student services. The library. The departmental major requirements. Required of all department majors. Graded S/U.

### **110 - INTRODUCTION TO TECHNOLOGY**

4.00 Credits

For students majoring, minoring, or interested in the Department of Technology. An overview of technology and industry and the two career path options offered by the Department: technology management and technology education. Major technology systems: construction, manufacturing, communication, energy/power/transportation, and management. Lab activities and visitations utilized to reinforce concepts.

### **120 - INTRODUCTION TO COMPUTER AIDED DESIGN**

4.00 Credits

Graphic representation using the personal computer. Attention will be placed on the standards of the technical graphics field and the graphic illustration and visualization techniques as applied to CAD software. Develop proficient use of AutoCAD software for: orthographic projection, sections and conventions, auxiliary views, 3D drawings, and applied geometry. (Formerly TECH 220)

### **130 - METALLIC MATERIALS AND PROCESSES 1**

4.00 Credits

Major metallic industrial materials and their processes. The conversion of raw materials via extraction, refining, and processing into consumer products. An emphasis on safety, metallurgy, nondestructive testing, destructive testing and material processing will be applied.

### **139 - INTRODUCTION TO INFORMATION SYSTEMS**

4.00 Credits

The language, technology, techniques, applications, and management of information systems, including a laboratory component dealing with such issues as operating systems, word processing, spread sheets and data bases. (Formerly CS 130)

### **140 - MICROCOMPUTER APPLICATIONS IN TECHNOLOGY**

4.00 Credits

The development of basic computer literacy skills in windows environment. Common application software, such as word processing, database, spreadsheet, Power Point and web development will be used with an emphasis on accessing, organizing, managing, and presenting data for professional and personal communication.

### **190 - SPECIAL TOPICS IN TECHNOLOGY**

1.00 to 3.00 Credits

May be repeated as the topic varies.

### **200 - TECHNOLOGY AND SOCIETY**

4.00 Credits

The major concepts of technology; its development, its effects on society, and the problems associated with it. Critical evaluations through written and verbal activities.

### **221 - COMPUTER ASSISTED CONSTRUCTION DESIGN**

4.00 Credits

Construction planning, design, engineering and layout. Light construction principles, architectural details, plot surveying and layout, creation of architectural working drawings and cost estimating using Architectural Desktop PC-CAD software.

### **223 - COMPUTER ASSISTED PRODUCT DESIGN**

4.00 Credits

Technical sketching, product design processes and the components/variables of good design. Utilization of the computer in the design process to generate working drawings/designs for manufactured products. Oral presentations, analysis of product designs through solids modeling, prototype development and market surveys.

### **230 - METALLIC MATERIALS AND PROCESSES 2**

4.00 Credits

The metallic material processes involved in fabricating and machining of consumer products. Machining applications include turning, milling and drilling. Lecture topics include traditional and nontraditional material removal processes such as abrasive waterjet, EDM, electron beam, laser beam, and plasma machining. Fabrication applications include OXY-acetylene, MIG, TIG, SMAW (arc), and resistance welding.

### **231 - CUSTOM WOODWORKING**

#### *3.00 Credits*

Basic processes, tools, and materials employed in the production of custom, individually designed, and crafted wood products. May be repeated up to a total of nine hours.

### **232 - PRODUCT MANUFACTURING**

#### *4.00 Credits*

Machine operations in the manufacture of various types of products, primarily the processing of both traditional and non-traditional materials into consumer products. Emphasis on process design, material handling, organization of work, division of labor, distribution and sales practices relating the mass production industries. A major line production will be completed by each class. Prerequisites: TECH 120 (or GE 102) and 223.

### **240 - INTRODUCTION TO COMMUNICATION TECHNOLOGY**

#### *4.00 Credits*

The history of communication technologies, present day procedures, equipment, and materials that are associated with the graphic reproduction techniques of relief, lithography, screen, and copying/duplication as well as graphic layout, design, and composition using desktop publishing technology and finishing and binding. Video communication technology will be covered in addition to graphic reproduction topics.

### **244 - COMPUTER NETWORKING**

#### *3.00 Credits*

The equipment and procedures for selecting hardware and for configuring networking equipment and control software. Topics include the following: Network Terminology, Infrastructure (wiring topologies), LAN protocols (TCP/IP), Network Operating Systems (Windows, Linux), and network devices (configuring routers and switches). Prerequisites: TECH 139 or 140; GE 101 or ABUS 201 or ECCS 164.

### **261 - FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS**

#### *4.00 Credits*

The fundamentals of alternating and direct current will be explored in the context of changing technological advances. Basic electrical circuits and electronic parts will be utilized in electronic communication activities. The use and maintenance of test equipment will be emphasized during the testing of analog and basic digital circuits. (Formerly TECH 361)

### **280 - COOPERATIVE EXPERIENCE ORIENTATION**

#### *1.00 Credit*

Preparation to begin the co-op experience. Topics discussed include: identifying a position, development of the Co-op Plan, preparing for the first day, position expectations, outline of co-op requirements, getting the most from the experience, and record keeping. Sophomore technology majors with preliminary acceptance in the co-op program. Graded S/U.

### **290 - SPECIAL TOPICS IN TECHNOLOGY**

#### *1.00 to 3.00 Credits*

May be repeated as the topic varies.

### **294 - SOPHOMORE SEMINAR IN TECHNOLOGY**

#### *1.00 Credit*

Required of all technology majors near the end of their second year of college. Topics: assessment of basic skills, career planning, minor/option selection, review of academic performance, study skills, personality testing, and related topics. Meets one hour per week. Prerequisite: department major and five quarters work. Graded S/U.

### **321 - BASICS OF VIRTUAL SIMULATION**

#### *4.00 Credits*

Development of basic skills to create computer simulations of components, equipment, and processes using advanced industrial software. Includes user interface; file configurations and networks; creating parts, devices and workcells; CAD geometry importing and exporting; motion kinematics; graphical simulation language programming; robotic workcell creation; and off-line robotic programming and operation.

### **322 - VIRTUAL SIMULATION OF SYSTEMS**

#### *4.00 Credits*

Development of in-depth virtual simulations of discrete events provided by industrial and educational partners. Each student will utilize the newest generation of simulation applications based on the CATIA CAD/CAM system to produce simulations for advanced analysis of ergonomics and assembly sequencing in manufacturing environments. Team work and problem solving is required. Prerequisite: TECH 321.

### **332 - PLC'S AND INDUSTRIAL ROBOTICS**

#### *4.00 Credits*

Programmable logic controllers will be used to illustrate the concepts of input/output (I/O), relay logic, and ladder logic. Industrial robots will be introduced and on-line programming will include tasks such as welding, pick and place, finish application, and robot integration. Off-line programming of robots will also be introduced.

### **335 - CAD/CAM AND AUTOMATION SYSTEMS**

*4.00 Credits*

Computer automated manufacturing practices (CAD/CAM) will be used to convert CAD drawings to NC machine code, customize machine code, produce metallic and non-metallic products. Automated manipulation of industrial materials using educational robots, PLC's, NC machines, and computer integrated manufacturing techniques including vision, product identification, storage and retrieval. Prerequisites: TECH 120 (or GE 102) and 332 or their equivalent.

### **341 - PHOTOGRAPHY**

*3.00 Credits*

Techniques of photographic composition, camera types, uses and accessories, photographic optics, and laboratory methods and materials; dark room developing and printing of black and white photography.

### **342 - ELECTRONIC MEDIA DESIGN AND DEVELOPMENT 1**

*3.00 Credits*

Techniques of multimedia authoring and design using HTML, DHTML, CSS, Adobe Acrobat, and JavaScript. Activities include the use of imaging devices such as scanners, digital cameras, and video and audio recordings. Prerequisite: TECH 140 or equivalent.

### **343 - ELECTRONIC MEDIA DESIGN AND DEVELOPMENT 2**

*4.00 Credits*

Emphasizes building a dynamic and interactive web site using web based animation software. Topics include the effective use of vector/ bitmap images, frame-by-frame animation, motion and shape tween design, interactivity with mp3/wav sound files, movie files layers, scenes, and Basic ActionScript. Prerequisite: TECH 342.

### **350 - CONSTRUCTION TECHNOLOGY**

*4.00 Credits*

Basic concepts of construction techniques used today; including the methods and materials involved in framing, enclosing, and finishing residential and light commercial buildings. Study of financing, contracting, procuring, supervising, site-operation, foundation, structural elements, utilities, landscaping, and personnel associated with construction activities.

### **362 - DIGITAL ELECTRONICS: CONCEPTS AND APPLICATIONS**

*4.00 Credits*

Concepts and applications of digital, advanced digital, and basic microprocessor electronic circuits will be explored. An industrial-based application of these concepts will include the areas of robot construction, robotic interfacing, computer interfacing, sensors, controllers, and digital communication. Prerequisite: TECH 261. (Formerly TECH 462)

### **380 - PROFESSIONAL PRACTICE IN TECHNOLOGY**

*1.00 Credit*

Study and professional experience in a technology-related occupation in an industrial enterprise, consulting firm, or governmental agency. A midterm and final report on the assignment and employer's evaluation are required. May be repeated up to a total of 6 hours. Prerequisites: TECH 280, junior status, and minimum 2.5 accumulative GPA. Graded S/U.

### **390 - SPECIAL TOPICS IN TECHNOLOGY**

*1.00 to 3.00 Credits*

May be repeated as the topic varies.

### **412 - MANUFACTURING MANAGEMENT**

*4.00 Credits*

Industrial management including facility planning, process planning and design, industrial equipment selection and maintenance, materials handling, inventory and production control, quality assurance, and safety. Also covers just-in-time inventory control and lean manufacturing, automatic identification, bar coding, self-directed work teams and conflict resolution. Independent industrial case study.

### **421 - SOLID MODELING FOR DESIGN**

*3.00 Credits*

Techniques of illustration and 3D solid modeling with CAD software. Activities include the design and analysis of 3D solid models, rapid prototyping and graphic illustration techniques of designed and finished products or constructed facilities.

### **423 - VIRTUAL SIMULATION PRODUCTION AND MANAGEMENT**

*4.00 Credits*

Development of advanced virtual simulations of discrete events. Factory layouts and process flows are analyzed utilizing state-of-the-art simulation software and computer equipment. Focus on project management, analysis, and class presentations. Prerequisites: TECH 321 and 322.



### **430 - NONMETALLIC MATERIALS AND PROCESSES**

*4.00 Credits*

Nonmetallic materials and processing. Conversion of raw materials into consumer products via refining and processing. Major emphasis on polymers, ceramics, wood, and composites, with coverage of fibers, fabrics, leathers, and miscellaneous nonmetallics.

### **435 - ADVANCED ROBOTICS/AUTOMATION**

*2.00 Credits*

Advanced investigation of robotics and automated equipment. Topics of investigation will include robot construction, robot programming, PLC's, CAD/CAM, CIM, FMS, workcell construction. Problem solving based in manufacturing situations is the main emphasis. Prerequisites: TECH 140 and 332; and TECH 120 or GE 102. May be repeated up to a maximum of 8 hours.

### **441 - ADVANCED PHOTOGRAPHY**

*3.00 Credits*

Advanced camera handling techniques, darkroom manipulations of negatives, the large format black and white medium, color positive photography, digital photography. Prerequisite: TECH 341 or equivalent.

### **460 - ENERGY AND TRANSPORTATION**

*4.00 Credits*

Concepts of energy conversion, power transmission, and applications. Methods of maintaining and repairing energy conversion and transmission devices. A focus is placed on the major components of transportation systems such as propulsion, guidance, suspension, control, support, and structure systems used in stationary and vehicular systems.

### **470 - QUALITY ASSURANCE AND WORK MEASUREMENT**

*4.00 Credits*

Methods applied in mass production industries. Quality topics include Statistical Process Control, TQM, Lean Mfg. and Six Sigma, ISO/QS/TS quality systems, and automatic identification and data capture. Work measurement topics include methods engineering, traditional time studies, predetermined time measurement and work sampling.

### **484 - INTERNSHIP IN TECHNOLOGY**

*5.00 to 15.00 Credits*

A supervised program of experiences in production practices, management techniques, research applications, and other activities representative in modern industry. Selection is based upon proper application, screening, and acceptance by an appropriate industry. Five hours of credit for 3-4 weeks of full time work in the summer or fifteen hours of credit for one full time quarter during the year. Graded S/U. A maximum of fifteen hours to count toward graduation.

### **490 - SPECIAL TOPICS IN TECHNOLOGY**

*1.00 to 3.00 Credits*

May be repeated as the topic varies.

### **491 - STUDENT TEACHING SEMINAR**

*1.00 Credit*

Required to be taken concurrently with student teaching and is in addition to Education Department Seminar EDUC 475. Reinforces field experiences as well as develops insights into implementation of recent curriculum development in Technology Education. Corequisites: EDUC 470 and/or 480. Graded S/U.

### **494 - SENIOR SEMINAR IN TECHNOLOGY**

*1.00 Credit*

Required of majors in technology who are within three quarters of graduation. Career planning, placement services, the employment search, graduate school, senior project review, graduation procedures, and related issues. Graded S/U.

### **495 - SENIOR PROJECT IN TECHNOLOGY**

*1.00 Credit*

Individual study and senior capstone experiences involved with the investigation and application of technological subject matter. Involves researching and developing, testing, fabricating, assembling, and evaluating designs. May be repeated for a total of 3 credit hours.

### **496 - TOUR OF AMERICAN INDUSTRIES**

*1.00 Credit*

Participation with the annual department-sponsored comprehensive tour of industries including the structured pre- and post-trip seminars and the submission of a written technical report pertaining to one or more facets of the experience. May be repeated to a total of five hours. Graded S/U.

### **497 - INDEPENDENT STUDY IN TECHNOLOGY**

*1.00 to 3.00 Credits*



# Business Administration

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## Terry L. Maris, *Dean*

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Professors Goldberg, Meininger (Associate Dean), Woods; Associate Professors Banfe, Chipalkatti, Christopher, Ewing, Govekar, Miceli, Rishi, Savino; Assistant Professors Alhajji, Heinfeldt, Kleine, Zekany; Computer Applications Professional Elsass

### Patton Chair

**The George Willard Patton Chair of Business and Economics**, endowed by the Richard King Mellon Charitable Trust of Pittsburgh, Pennsylvania, has been established beginning with the academic year 1973-74. The 2002-03 recipient of this endowed professorship is Dexter Woods, professor of business administration.

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## Mission Statement

The College of Business Administration prepares students to become business and community leaders in a changing world. The College emphasizes active learning, global awareness, entrepreneurial spirit, technological proficiency and applied research.

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## Admissions Standards

Candidates seeking admission to the College of Business Administration are required to meet the general requirements for admission to the University. The College of Business Administration accepts high school graduates who have 16 acceptable units of high school credits. Thirteen of these units are prescribed as follows: Four units of English; three units of mathematics (including algebra and geometry); six units in history, social studies, language, or natural science, or any combination thereof. Candidates are encouraged to pursue a foreign language while in high school. Acceptable scores on the American College Test or the College Entrance Examination Board Test are expected of all candidates.

**Transfer Students** The Ohio Northern University College of Business Administration welcomes students from other accredited colleges and universities. Applications for transfer will be considered only if the student has a prior grade point average of 2.00 on a 4.00 scale, and the

student is eligible to return to his/her former institution.

Students transferring from a two-year associate degree program are advised that courses in advanced business subjects (i.e., offered at the college's 300 or 400 level) taken at a two-year institution are not normally granted credit as equivalents of the business courses taught at Ohio Northern University. Such courses can be accepted as general electives. Under certain circumstances, students could establish equivalent credit through college-administered proficiency tests.

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## Degree Requirements in General Education

### *Communication Skills*

1. Writing 1 and 2 (ENGL 110 and 111)
2. One other English course

### *Fine Arts*

1. One Fine Arts course (ART 100, MUSC 100, or COMM 105)

### *Humanities*

1. One Religion course (RELG 105, 107, 108, 109 or 110)
2. One philosophy course
3. Western Civilization 1 and 2 (HIST 110 and 111)

### *Social Sciences*

1. One Social Science Division course

### *Mathematics and Natural Sciences*

1. Finite Mathematics (MATH 144), Calculus with Business Applications (MATH 145), and Statistics (STAT 146)
2. One science course

### *Health and Physical Education*

1. Three physical education service courses (AHPE). A maximum of six such hrs. will count toward graduation.

### *Additional General Education Requirements*

#### **For accounting and management majors:**

A. Public Speaking (COMM 211), Interpersonal Communication (COMM 225), and one additional communication course selected from the Professional and Organizational Communication discipline.

B. Eight elective hrs. taken in the College of Arts and Sciences

**For international business and economics majors:**

A. Public Speaking (COMM 211) or Interpersonal Communication (COMM 225)

B. Demonstrated competency in a foreign language through the second year of college level studies. This requirement may be waived for students whose native language is other than English.

C. An international study and/or internship experience.

An approved Honors Seminar may fulfill a requirement listed above. For specific information, see the office of the dean.

**Business Administration Core Courses**

ABUS 000	Orientation
ABUS 120	Ethics in Bus. Prac.
ABUS 201	Personal Computer Appl. for Business
IBEC 202	Prin. of Microeconomics
IBEC 203	Prin. of Macroeconomics
ACCT 211 & 212	Prin. of Acct. 1 and 2
MGMT 240	Mgmt. Info. Systems
IBEC 300	Environ. of Int'l. Bus.
ABUS 312	Business Law 1
MGMT 333	Mgmt. & Org. Beh.
MRKT 351	Prin. of Marketing
FINC 362	Managerial Finance
MGMT 364	Production and Op. Mgmt.
MGMT 485	Bus. Policy and Strategy
One elective in economics discipline area	

## SPECIFIC MAJORS AND MAJOR COURSE REQUIREMENTS

Beyond the general education requirements and the business core, students must also complete specific requirements in their major areas.

The College of Business Administration offers three major areas of study: accounting; international business and economics; and management.

**Accounting**

The accounting program offers a four-year (182 quarter hour) degree program that prepares students for many entry-level accounting positions. Students completing the accounting major will have the necessary educational requirements for the Certified Management Accounting (CMA) and the Certified Internal Auditing (CIA) examinations.

The curriculum core for the accounting major includes ACCT 301, 302, 314, 315, ACCT 435 or FINC 467, and eight hours of upper division accounting electives.

### Bachelor of Science In Business Administration Accounting Major

*First Year*

ABUS 000	Orientation	1 hr.
ABUS 120	Ethics in Bus. Prac.	4 hrs.
ABUS 201	Pers. Computer Appl.	4 hrs.
AHPE	Phys. Ed. Electives	3 hrs.
COMM 211	Public Speaking	4 hrs.
ENGL 110, 111	Writing 1 and 2	8 hrs.
HIST 110, 111	W. Civ. 1 and 2	8 hrs.
MATH 144	Finite Math.	4 hrs.
MATH 145	Calc. with Bus. Appl.	4 hrs.
ART 100 or COMM 105 or MUSC 100	Fine Arts Elective Soc. Sci. Elective	4 hrs. 4 hrs.
TOTAL		48 hrs.

*Second Year*

STAT 146	Statistics	4 hrs.
ACCT 211, 212	Prin. of Acct. 1, 2	8 hrs.
IBEC 202, 203	Micro. & Macro.	8 hrs.
MGMT 240	Mgmt. Info. Syst.	4 hrs.
ENGL	English Elective	4 hrs.
PHIL	Philosophy Elective	4 hrs.
	Science Elective	4 hrs.
COMM 225	Interpersonal Comm.	4 hrs.
COMM	Comm. Elective	4 hrs.
RELG	Religion Elective	4 hrs.
TOTAL		48 hrs.

*Third Year*

ACCT 301, 302	Intermediate Acct. 1, 2	8 hrs.
ABUS 312	Business Law 1	4 hrs.
ACCT 314, 315	Int. Manag. Acct. 1, 2	8 hrs.
IBEC 300	Environ. of Int'l. Bus.	4 hrs.
MGMT 333	Mgmt. & Org. Beh.	4 hrs.
MRKT 351	Prin. of Marketing	4 hrs.
FINC 362	Managerial Finance	4 hrs.
MGMT 364	Prod. & Ops. Mgmt.	4 hrs.
	Arts & Sciences Elect.	4 hrs.
TOTAL		44 hrs.

*Fourth Year*

ACCT 435 or FINC 467	International Acct.	4 hrs.
	International Finance	4 hrs.
	Arts & Sciences Elect.	4 hrs.
MGMT 485	Bus. Policy & Strategy	4 hrs.
ACCT	Accounting Electives	8 hrs.
IBEC	Economics Elective	4 hrs.
	General Electives	18 hrs.
TOTAL		42 hrs.

## CPA Program

In many states including Ohio, students planning to sit for the Certified Public Accounting (CPA) examination will have to have earned 150 semester (225 quarter) hours of academic credit. Students may earn the additional hours needed for the CPA examination by taking additional undergraduate courses. Students should consult with their academic advisors and their State Boards of Accountancy for specific course and degree requirements. Additional recommended accounting courses for the CPA program include ACCT 303, 387, 388, 392, 402, 403, 404, and ABUS 313. Twelve additional hours of elective course work in the College of Arts and Sciences are also recommended.

## International Business and Economics

The curriculum core for the international business and economics major includes: IBEC 352, 385, 453, 467, and 486.

## Bachelor of Science in Business Administration International Business and Economics Major Curriculum

### First Year

ABUS 000	Orientation	1 hr.
ABUS 120	Ethics in Bus. Prac.	4 hrs.
ABUS 201	Pers. Computer Appl.	4 hrs.
AHPE	Phys. Ed. Electives	3 hrs.
ENGL 110, 111	Writing 1 and 2	8 hrs.
HIST 110, 111	Western Civ. 1 and 2	8 hrs.
MATH 144	Finite Math.	4 hrs.
MATH 145	Calc. with Bus. Appl.	4 hrs.
	Foreign Language	12 hrs.
<b>TOTAL</b>		<b>48 hrs.</b>

### Second Year

ART 100 or COMM 105 or MUSC 100	Fine Arts Elective	4 hrs.
ACCT 211, 212 COMM 211 or 225	Prin. of Accounting 1, 2	8 hrs.
IBEC 202, 203	Speech Comm. Microeconomics and Macroeconomics	4 hrs. 8 hrs.
STAT 146	Statistics	4 hrs.
MGMT 240	Mgmt. Information Syst.	4 hrs.
ENGL	English Elective Foreign Language	4 hrs. 12 hrs.
<b>TOTAL</b>		<b>48 hrs.</b>

### Third Year

ABUS 300	Environ. of Int'l. Bus.	4 hrs.
ABUS 312	Business Law 1	4 hrs.
MGMT 333	Mgmt. & Org. Beh.	4 hrs.
MRKT 351	Prin. of Marketing	4 hrs.
IBEC 352	Money & Banking	4 hrs.

FINC 362	Managerial Finance	4 hrs.
IBEC 385	Int'l. Economics	4 hrs.
IBEC 467	Int'l. Finance	4 hrs.
PHIL	Philosophy Elective	4 hrs.
	Science Elective	4 hrs.
RELG	Religion Elective	4 hrs.
<b>TOTAL</b>		<b>44 hrs.</b>

### Fourth Year

MGMT 364	Prod. & Ops. Mgmt.	4 hrs.
IBEC 453	Int'l. Mrkt.	4 hrs.
MGMT 485	Bus. Policy & Strat.	4 hrs.
IBEC 486	Int'l. Mgmt.	4 hrs.
IBEC	Economics Elective	4 hrs.
	Social Science Elective	4 hrs.
	General Electives	18 hrs.
<b>TOTAL</b>		<b>42 hrs.</b>

## Management

The curriculum core for the management major includes: MGMT 334, 363, 486, and 12 hrs. of upper division management electives.

## Bachelor of Science in Business Administration Management Major Curriculum

### First Year

ABUS 000	Orientation	1 hr.
ABUS 120	Ethics in Bus. Prac.	4 hrs.
ABUS 201	Pers. Computer Appl.	4 hrs.
AHPE	Phys. Ed. Electives	3 hrs.
COMM 211	Public Speaking	4 hrs.
ENGL 110, 111	Writing 1 and 2	8 hrs.
HIST 110, 111	Western Civ. 1 and 2	8 hrs.
MATH 144	Finite Math.	4 hrs.
MATH 145	Calc. with Bus. Appl.	4 hrs.
ART 100 or COMM 105 or MUSC 100	Fine Arts Elective Social Science Elective	4 hrs. 4 hrs.
<b>TOTAL</b>		<b>48 hrs.</b>

### Second Year

PHIL	Philosophy Elective	4 hrs.
ACCT 211, 212 IBEC 202, 203	Prin. of Accounting 1, 2 Microeconomics and Macroeconomics	8 hrs. 8 hrs.
STAT 146	Statistics	4 hrs.
MGMT 240	Mgmt. Information Syst.	4 hrs.
ENGL	English Elective	4 hrs.
RELG	Religion Elective	4 hrs.
	Science Elective	4 hrs.
COMM 225	Interpersonal Comm.	4 hrs.
COMM	Comm. Elective	4 hrs.
<b>TOTAL</b>		<b>48 hrs.</b>

### Third Year

IBEC 300	Environ. of Int'l. Bus.	4 hrs.
ABUS 312	Business Law 1	4 hrs.
MGMT 333	Mgmt. & Org. Beh.	4 hrs.
MGMT 334	Cases & Exer. in Org. Beh.	4 hrs.
MRKT 351	Prin. of Marketing	4 hrs.
FINC 362	Managerial Finance	4 hrs.

MGMT 363	Human Resource Mgmt.	4 hrs.
MGMT 364	Prod. & Ops. Mgmt.	4 hrs.
	Arts & Sciences Elect.	8 hrs.
IBEC	Economics Elective	4 hrs.
<b>TOTAL</b>		<b>44 hrs.</b>

#### *Fourth Year*

MGMT 485	Bus. Policy & Strategy	4 hrs.
MGMT 486	Int'l. Mgmt.	4 hrs.
MGMT	Management Electives	12 hrs.
	General Electives	22 hrs.
<b>TOTAL</b>		<b>42 hrs.</b>

## Dual Majors

No course used to satisfy either a specific requirement or a discipline elective may be counted toward a dual major except as a general elective.

## Minor in Business Administration

The minor is available only to non-business majors. A "C" grade or higher is required in all courses. A minimum of 20 hours required for the minor must be completed at Ohio Northern University. Students are advised that MATH 144, Finite Mathematics, or its equivalent is prerequisite to FINC 362, Managerial Finance.

IBEC 202, 203	Microeconomics and Macroeconomics	8 hrs.
ACCT 211, 212	Prin. Acct. 1, 2	8 hrs.
ABUS 312	Business Law 1	4 hrs.
MGMT 333	Mgmt. & Org. Beh.	4 hrs.
MRKT 351	Prin. of Marketing	4 hrs.
FINC 362	Managerial Finance	4 hrs.
	an approved elective	4 hrs.
<b>TOTAL</b>		<b>36 hrs.</b>

## Minor in Marketing

The marketing minor is available to both business and non-business majors. A grade of "C" or higher is required in all of the marketing courses. A minimum of 16 hours required for the minor must be completed at Ohio Northern University.

STAT 146	Business Statistics	4 hrs.
	(or equivalent, STAT 142 or 156)	
MRKT 351	Principles of Marketing	4 hrs.
MRKT 434	Marketing Research	4 hrs.
	Marketing Electives	16 hrs.
<b>TOTAL</b>		<b>28 hrs.</b>

## Graduation Requirements

### Bachelor of Science in Business Administration

It is the student's responsibility to assure that all of the graduation requirements for the degree and major(s) sought are satisfied:

1. The general education specific and elective courses in the College of Arts and Sciences.
2. The Business Administration core requirements and electives.
3. The specific major requirements and electives.
4. Satisfactory completion and presentation of a minimum of 182 quarter hours of appropriate course work for the specific major(s).
5. A minimum of 28 hours of required business courses at the 300 or 400 level to be completed at Ohio Northern University with at least 16 of these hours taken in the student's major.
6. A minimum 2.00 grade point average.
7. A letter grade of "C" or better in all but one course specified in (2) and (3) above.

## 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 program consists of 12 to 19 scheduled hours, including physical education. See page 18 for overload charges beyond 19 credit hours.

2. All freshmen in the College of Business Administration are required to take orientation, which is scheduled in the fall quarter.

3. All students are expected to participate in college program assessment activities.

4. All students are expected to participate in selected college-sponsored service activities that contribute to professional development.

5. A student indicates his/her major choice by completing a declaration of major form available in the Office of the Dean. Faculty advisors assist the student in the planning of his/her major.

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. CBA majors need to complete ACCT 211 with a C grade or higher before attempting ACCT 212.

8. With the written permission of the instructor and the dean, course prerequisites may be waived.

9. 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.

10. 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.

11. To participate in the internship program, a student must have junior or senior status and a minimum 2.5 GPA for a domestic placement and a 3.0 GPA for an international placement.

12. Students must have junior standing or higher to enroll in 300 and 400 level College of Business Administration courses.

13. Non-College of Business Administration majors may not accumulate more than 44 hours of credit in business courses without the written approval of the dean of the College of Business Administration.

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## S/U Grade Option

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

1. The student must be registered full-time in the College of Business Administration.
2. The student must have sophomore, junior, senior, or postgraduate standing.
3. The requested course cannot be in the College of Business Administration except those specified as S/U in course descriptions.
4. The course cannot be a 100-level general education course.
5. The requested course cannot be a cognate. CBA cognates include all required mathematics and speech communication courses.
6. The grade of "S" is to be equated with A, B, C, and the grade of "U" is equated with D or F. S/U grades are not computed in the accumulative grade point average.
7. The student cannot change the grading option after the second week of classes.

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## Service and Activities Courses

A combined maximum of 24 hrs. of credit in varsity sports, physical education service courses, applied music, and music performance courses may be counted for graduation. Service and activity courses cannot be used to satisfy College of Arts and Sciences elective requirements. Only three credits in the same varsity sport may be counted toward graduation. Only six credits in the same music performance activity may be counted toward graduation.

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## Classification of Students

For purposes of classification, the minimum requirements for sophomore standing are 45 quarter hrs. of completed academic work; for junior standing 90 quarter hrs.; and for senior standing 135 quarter hrs.

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## Academic Standing

A grade point average of 2.00 or higher is required for graduation. If a student's accumulative grade point average falls below 2.00, he/she is placed on academic probation and is not eligible to participate in competitive activities of individuals, teams, or other groups officially designated as representing the University.

Any student on probation whose work for the following quarter continues below 2.00 accumulative grade point average will have his/her record reviewed by the Academic Qualifications and Scholarship Committee of the college and may be recommended to the dean for suspension or dismissal from the college. Any student with a quarterly GPA of less than 1.00 may be placed on probation or suspended.

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## Prelaw Program

Business students interested in the Prelaw Program will find a complete description on page 33 of this publication.

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## Leadership Studies Option

A Leadership Studies Option is available to majors in the College of Business Administration. A complete description of this option can be found in the Department of History, Political Science and Criminal Justice program listings.

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## Small Business Institute

The Small Business Institute (SBI) provides intensive business counseling by utilizing small teams of qualified university students in business disciplines under expert faculty guidance. The students meet frequently over the course of a full university term with the small business owner to identify and solve unique business problems.

The SBI program was established by the Small Business Administration in 1972. Approximately 500 business colleges have been carefully chosen throughout the United States to administer this program.

A detailed case report is written and given to the client with suggestions as to how to implement it. SBI teams work on most business-related problems and provide recommendations tailored to the specific needs of the business.

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## Internship Program

The internship program in the College of Business Administration has been designed to help students gain these valuable experiences while still in college. By combining the concepts discussed in the classroom with practical on-the-job experiences, the internship program helps prepare the businessmen and businesswomen of tomorrow.

Academic year internships may be full- or part-time programs lasting 10 weeks. Interns may earn as many as 16 quarter hours of credit.

Summer internships take place in several locations throughout Ohio and beyond. As with academic-year internships, students may earn up to 16 credit hours.

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## Dual Degree Programs

Information concerning dual degree programs involving the College of Business Administration appears on page 33 of this catalog. Students may receive further details in the office of the dean of the college.

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## Microsoft Authorized Testing Center

The College of Business Administration houses an authorized testing center for Microsoft Office certification. The certification program is designed to validate desktop computer skills using Microsoft Office applications. Certification proves computer literacy, measures proficiency, and identifies opportunity for skills enhancement. Certification testing is available for Microsoft Word, Excel, Power Point, Access, and Outlook applications. Internet and Computing Core Certification (IC<sup>3</sup>) testing is also available in the College of Business Administration.

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## International Business Program

The international business program is coordinated by the College's International Experience Committee. Students may participate in study abroad, work abroad, or student exchange.

Study abroad may take place at virtually any foreign college or university if the academic program is determined to meet certain standards for transfer of credit. Students are encouraged to enroll for a full academic year abroad. In some cases, study may occur during the summer or for a lesser period during the academic year.

Work abroad is available to ONU business students in cooperation with the Council on International Educational Exchange. This option may be combined with study abroad or pursued independently during the summer. A special bonus is that such employment may qualify the student to earn up to 16 credits toward graduation through the internship program.

Formal agreements for the exchange of students between Ohio Northern University and several prominent foreign institutions offer many opportunities for business students. These include Glasgow Caledonian University (Scotland), the University of Science and Technology of Lille (France), the Plekhanov Economic Academy (Russia), Arnhem Business School (Netherlands), Helsinki School of Economics (Finland), Instituto Tecnológico y de Estudios Superiores de Monterrey, Campus Queretaro (Mexico), the University of Ulster (Northern Ireland), Southern Cross University (Australia), and Universidad Latina de Costa Rica (Costa Rica). Additional study-abroad experiences have taken place at the University of the Andes (Venezuela), Universidad Católica de Valparaíso (Chile), Bond University (Sydney, Australia), and Universidad Iberoamericana (Mexico).

The College also sponsors summer international business tours designed to satisfy the international experience requirement of International Business and Economics majors. The programs are open to all students and provide an opportunity to visit a variety of international corporations and agencies.

Recent tours have included visits to Paris, London, Rome, Madrid, Havana, Santiago de Cuba, and other major cities. In each country the students visited companies, agencies and offices where they participated in tours, lectures, interviews and discussions related to their majors. Past hosts for the visits include: BMW, Arthur Andersen, World Trade Organization, Union Bank of Switzerland, Hard Rock Café, BP Amoco, Paris Disneyland, Siemens, House of Versace, United Nations, TDK Corporation, Cooper Avon Tyre, Caterpillar, Inc., Universidad de la Habana, and Havana Tobacco Company.

Students with a foreign language background are likely to find that they have more opportunity to take advantage of these programs. All business students therefore are strongly advised to continue their foreign language study at ONU. Those who have no prior course work in foreign language are encouraged to incorporate such courses into their undergraduate studies.



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# COLLEGE OF BUSINESS ADMINISTRATION

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## ***Subject - General Business (ABUS)***

### **000 - ORIENTATION / CAREER DEVELOPMENT AND RESEARCH**

#### *1.00 Credit*

Familiarization with the college, requirements of the majors, planning sequences of courses, university catalog and library, career investigation and guidance. Activities include a service requirement. Fall Quarter. Graded S/U.

### **120 - ETHICS IN BUSINESS PRACTICE**

#### *4.00 Credits*

Systematic examination of alternative ethical decision making approaches followed by case analysis and discussion. Provides individual reflection and experience in alternative ethical approaches. Not open to students entering the College of Business prior to Fall Quarter 1998.

### **190 - SPECIAL TOPICS IN BUSINESS**

#### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **201 - PERSONAL COMPUTER APPLICATIONS FOR BUSINESS**

#### *4.00 Credits*

Business applications for microcomputers. Introductory level use of software for word processing, file management, spreadsheets, and graphics.

### **312 - BUSINESS LAW 1**

#### *4.00 Credits*

The legal environment in which businesses must operate. Topics include business ethics, sources of law, methods of dispute resolution, and the basic law regulating contracts, agency, business organizations, the workplace, consumer transactions, purchase and sale of securities, anticompetitive activities, actions affecting the environment, and international business transactions. Prerequisite: Junior standing.

### **313 - BUSINESS LAW 2**

#### *4.00 Credits*

The law as it applies to certain private business transactions. Topics include contracts, sales, commercial paper, secured transactions, suretyship, bankruptcy, insurance, property, landlord/tenant, wills, estates, and trusts. Prerequisite: ABUS 312.

### **475 - SMALL BUSINESS INSTITUTE**

#### *4.00 Credits*

A team is assigned to work with a small business under supervision of a faculty member. A confidential and professional relationship is maintained between the team and the client business. May be repeated for a maximum of 8 hours. Credit earned can be used only as general elective hours. SBI credit can not be used to satisfy either major or business elective requirements. Restricted enrollment. Prerequisite: Permission of Director. Graded S/U.

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## ***Subject - Accounting (ACCT)***

### **211 - PRINCIPLES OF ACCOUNTING 1**

#### *4.00 Credits*

Analysis and recording of business transactions and accumulating data on the results of economic activity, concepts and issues of financial reporting for business entities, including basic theory of the report writing model. Basic financial statement analysis. Prerequisite: Sophomore standing.

### **212 - PRINCIPLES OF ACCOUNTING 2**

#### *4.00 Credits*

Continuation of ACCT 211. Uses of accounting data to support management decision-making and control of business operations, determination of costs and cost behavior. Specialized application areas of accounting. Prerequisite: Sophomore standing and ACCT 211.

### **292 - SPECIAL TOPICS IN ACCOUNTING**

#### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **301 - INTERMEDIATE ACCOUNTING 1**

#### *4.00 Credits*

Financial accounting functions and basic theory. Preparation of financial statements and actuarial methods. Current assets. Prerequisite: ACCT 212.

### **302 - INTERMEDIATE ACCOUNTING 2**

#### *4.00 Credits*

Preparation of financial statements, operational assets, long term liabilities, leases, and owners' equity. Prerequisite: ACCT 301.

### **303 - INTERMEDIATE ACCOUNTING 3**

#### *4.00 Credits*

Preparation of financial statements. Pensions and post-retirement benefits, accounting changes, deferred income taxes, financial statement analysis, changing prices, special topics and EPS. Prerequisite: ACCT 302.

### **314 - INTERMEDIATE MANAGERIAL ACCOUNTING 1**

#### *4.00 Credits*

Emphasis on accounting information for decision making. Controls for material, labor and overhead cost. Cost-Volume-Profit analysis. Job order and process costing systems. Budgeting procedures. Standard costs and variance analysis. Variable costing and responsibility accounting for management reporting. Cost behavior pattern analysis. Decision models. Prerequisite: ACCT 212.

### **315 - INTERMEDIATE MANAGERIAL ACCOUNTING 2**

#### *4.00 Credits*

Cost allocation: service department cost and joint cost. Process costing in depth and accounting for defective units and scrap. Capital budgeting techniques. Responsibility accounting for management reporting. Prerequisite: ACCT 314.

### **316 - ADVANCED MANAGERIAL ACCOUNTING**

#### *4.00 Credits*

Advanced Corporate Budgeting procedures. An in-depth analysis of product costing techniques including activity based costing, analysis of cost drivers, total quality management. Topics in strategic cost management and current issues and techniques in management accounting. Offered alternate years. Prerequisite: ACCT 315.

### **387 - TAXATION 1**

#### *4.00 Credits*

Tax concepts in the taxation of individuals and entities. The role of taxation in business decisions, how to conduct basic tax research, tax planning, and professional standards and ethics. Interrelationships and differences between financial and tax accounting. Prerequisite: ACCT 212.

### **388 - TAXATION 2**

#### *4.00 Credits*

Continuation of Taxation 1 including business entity and multi-jurisdictional taxation, individual tax planning, fiduciary and tax-exempt accounting and tax preparation software. Prerequisite: ACCT 387.

### **392 - ADVANCED FINANCIAL ACCOUNTING**

#### *4.00 Credits*

Various forms of business combinations and intercompany transactions, transactions denominated in foreign currencies, and government accounting. Offered alternate years. Prerequisite: ACCT 302.

### **402 - ACCOUNTING INFORMATION SYSTEMS**

#### *4.00 Credits*

The use, evaluation, and design of accounting information systems with emphasis upon the interface of accounting systems and computer technology. Prerequisite: ACCT 302.

### **403 - AUDITING 1**

#### *4.00 Credits*

Auditing procedures and practices relating to the independent verification of financial records, including assessment of the internal control system, audit evidence, issues of materiality and risk, and audit reports. Prerequisite: ACCT 402.

### **404 - AUDITING 2**

#### *4.00 Credits*

Statistical sampling in auditing, auditor's professional ethics and legal liability, computer technology in auditing, and current issues and problems in auditing. Prerequisite: ACCT 403.

### **427 - INTERNSHIP IN ACCOUNTING**

#### *1.00 to 16.00 Credits*

Field experience in accounting. Graded S/U. Can be repeated for a maximum of 16 credit hours. Can be used only as general elective hours. Can not be used to satisfy either accounting or business elective requirements. Consult advisor.

### **435 - INTERNATIONAL FINANCIAL ACCOUNTING**

#### *4.00 Credits*

Financial accounting from a multinational viewpoint. Includes: financial accounting for international operations, comparative international accounting principles, and international financial reporting. Prerequisite: ACCT 302. (Also listed as IBEC 435.)

### **492 - SPECIAL TOPICS IN ACCOUNTING**

#### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **499 - INDEPENDENT STUDY IN ACCOUNTING**

#### *1.00 to 4.00 Credits*

An in-depth exploration of a subject of special interest to both the student and the faculty member. Can be repeated as topic varies. Prerequisite: Junior standing and approval of the instructor. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the College prior to registration.

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## **Subject - Finance (FINC)**

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### **362 - MANAGERIAL FINANCE**

*4.00 Credits*

The role of financial management in the firm, and the basic tools and concepts of the firm's investment, financing and dividend decisions including working capital management, capital budgeting and capital structure strategies. Prerequisites: MATH 144 and ACCT 212.

### **369 - INTERMEDIATE FINANCIAL MANAGEMENT**

*4.00 Credits*

Advanced concepts and methods employed in financial management. Topics include financial analysis and planning, working capital management, risk analysis and valuation of long-term investments, and capital structure analysis. Case method and personal computer based spreadsheets will be used. Offered alternate years. Prerequisite: FINC 362.

### **421 - INTERNSHIP IN FINANCE**

*1.00 to 16.00 Credits*

Field experience in finance. Graded S/U. Internship experiences can be repeated for a maximum of sixteen credit hours. Can be used only as general elective hours and can not be used to satisfy either finance or business elective requirements. Consult advisor.

### **461 - INVESTMENTS**

*4.00 Credits*

The risk-return trade off and distinctive characteristics of different vehicles of financial investment including equities; debt and derivatives; portfolio management; the functioning and regulation of securities markets; the operation of mutual funds and other investment companies. The Efficient Markets Hypothesis receives special attention. Foundations for corporate as well as personal investment decisions. Computer simulations and applications. Offered alternate years. Prerequisite: FINC 362.

### **467 - INTERNATIONAL FINANCE**

*4.00 Credits*

The unique financial challenges and opportunities faced by a multinational enterprise. Hedging as a pivotal tool of exchange rate risk management; the long-term and short-term financing opportunities available to a multinational enterprise; international cash management; and multinational capital budgeting. Prerequisites: FINC 362 and IBEC 300. (Also listed as IBEC 467.)

### **494 - SPECIAL TOPICS IN FINANCE**

*1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **500 - INDEPENDENT STUDY IN FINANCE**

*1.00 to 4.00 Credits*

An in-depth exploration of a subject of special interest to both the student and the faculty member. Can be repeated as topic varies. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the College prior to registration. Restricted enrollment. Prerequisites: Junior standing and approval of faculty member.

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## **Subject - International Business and Economics (IBEC)**

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### **100 - ECONOMICS**

*4.00 Credits*

The origins, characteristics and functions of our economic organization, current institutional arrangements, the use of appropriate tools of economic analysis; relevant economic and social goals. A terminal course for non-business majors. May not be taken following a successful enrollment in IBEC 202 or IBEC 203. (Discipline: Economics)

### **202 - PRINCIPLES OF MICROECONOMICS**

*4.00 Credits*

Economics of the individual firm in the free market economy; competitive and monopolistic markets. How prices ration goods and services to users, and the principles on which the total product is divided among the owners of the factors of production. Actual cases from business. No prerequisite. (Discipline: Economics)

### **203 - PRINCIPLES OF MACROECONOMICS**

*4.00 Credits*

Forces that determine the behavior of national income and output, unemployment, and the price level. Rudiments of money and banking, monetary and fiscal policy, growth and development. Selected issues of contemporary social relevance. Prerequisite: IBEC 202. (Discipline: Economics)

### **290 - SPECIAL TOPICS IN INTERNATIONAL BUSINESS AND ECONOMICS**

*1.00 to 4.00 Credits*

Can be repeated as the topic varies.

## **292 - CROSS-CULTURAL MANAGEMENT**

### *4.00 Credits*

An examination of the application of societal and corporate culture and its consequences in managerial and organizational settings in Western Europe. Convergency with and divergency from American corporate culture will be explored. Prerequisite: Participation in a college sponsored summer business tour. (Also listed as MGMT 292.)

## **300 - THE ENVIRONMENT OF INTERNATIONAL BUSINESS**

### *4.00 Credits*

The unique functional and environmental features of international business. Analysis of economic, cultural, legal and political forces affecting international business operations. Examination of organizational responses to the challenges of international business organizations. Prerequisite: IBEC 203.

## **341 - LABOR ECONOMICS**

### *4.00 Credits*

Labor as a factor in production; labor mobility; theories of the determination of wages, and bargaining theory; history and methods of labor unions, and government are presented. Offered alternate years. Prerequisite: IBEC 203. (Discipline: Economics)

## **352 - MONEY AND BANKING**

### *4.00 Credits*

Theories of money and credit; commercial banking practices; reserve banking; monetary and banking laws; money market; money and credit in the world economy. Prerequisite: IBEC 203. (Discipline: Economics)

## **383 - INTERMEDIATE MICROECONOMIC THEORY**

### *4.00 Credits*

Special problems of pricing, production, and distribution under perfect competition, monopoly, oligopoly, and duopoly in the American economy. Offered alternate years. Prerequisite: IBEC 203. (Discipline: Economics)

## **384 - INTERMEDIATE MACROECONOMIC THEORY**

### *4.00 Credits*

The principles, measurement, analysis, and control of aggregate economic activity; the role of consumption, investment, and saving in achieving full employment output, economic growth and price stability. Offered alternate years. Prerequisite: IBEC 203. (Discipline: Economics)

## **385 - INTERNATIONAL ECONOMICS**

### *4.00 Credits*

Theories and current problems of trade between nations; governmental restrictions and controls; the importance of multilateral trade, balance of payments; scarce resources; population, and employment trends. Prerequisite: IBEC 203. (Discipline: Economics)

## **390 - DEVELOPMENT ECONOMICS**

### *4.00 Credits*

Problems facing developing economies: poverty, environmental destruction, famine, inequality, unemployment and rural stagnation. The role of policy-related change in the context of the well-being of people living in developing countries. Sustainable human development versus growth-centered development. Prerequisite: IBEC 203. (Discipline: Economics)

## **411 - COMPARATIVE ECONOMIC SYSTEMS**

### *4.00 Credits*

Comparative study of capitalism, socialism, communism and mixed economies. Emphasis on the economics of pricing, production, and distribution under different systems. Comparative analysis of selected countries. Offered alternate years. Prerequisite: IBEC 203. (Discipline: Economics)

## **423 - ECONOMICS OF THE PUBLIC SECTOR**

### *4.00 Credits*

Fiscal institutions and decisions of the Public Sector; the federal budget; public good analysis, public debt issues; evaluation of tax sources for the federal, state, and local government levels; and intergovernmental fiscal relationships. Offered alternate years. Prerequisite: IBEC 203. (Discipline: Economics)

## **426 - INTERNSHIP IN INTERNATIONAL BUSINESS AND ECONOMICS**

### *1.00 to 16.00 Credits*

Field experience in international business and/or economics. Graded S/U. Internship experiences can be repeated for a maximum of sixteen credit hours. Can be used as general elective hours and cannot be used to satisfy either international business and economics or business elective requirements.

### **435 - INTERNATIONAL FINANCIAL ACCOUNTING**

*4.00 Credits*

Financial accounting from a multinational viewpoint. Includes: financial accounting for international operations, comparative international accounting principles, and financial reporting. Prerequisite: ACCT 302. (Also listed as ACCT 435.)

### **442 - ECONOMIC HISTORY OF THE UNITED STATES**

*4.00 Credits*

Economic life in colonial America and the east-west migration; the development of modern business and industry in the United States; the corporation and its part in the nation's growth; the causes and consequences of the Great Depression. Offered alternate years. Prerequisite: IBEC 203. (Discipline: Economics)

### **453 - INTERNATIONAL MARKETING**

*4.00 Credits*

World markets, their respective consumers and environments, and the marketing management required to meet the demand of world markets in a dynamic and ever changing setting. Contrasting marketing in the United States with marketing in foreign countries. Case studies illustrate marketing problems faced by international marketers. Prerequisites: IBEC 300 and MRKT 351. (Also listed as MRKT 453.)

### **467 - INTERNATIONAL FINANCE**

*4.00 Credits*

The unique financial challenges and opportunities faced by a multinational enterprise. Hedging as a pivotal tool of exchange rate risk management; the long-term and short-term financing opportunities available to a multinational enterprise; international cash management; and multinational capital budgeting. Prerequisites: FINC 362 and IBEC 300. (Also listed as FINC 467.)

### **486 - INTERNATIONAL MANAGEMENT**

*4.00 Credits*

The application of management concepts and techniques in a multinational environment. The meaning of culture as it applies to international management. Issues in international human resource management. A focus on relevant business simulations and cases. Prerequisites: FINC 362, IBEC 300, MGMT 333 and MRKT 351. (Also listed as MGMT 486.)

### **490 - SPECIAL TOPICS IN INTERNATIONAL BUSINESS AND ECONOMICS**

*1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **497 - INDEPENDENT STUDY IN INTERNATIONAL BUSINESS AND ECONOMICS**

*1.00 to 4.00 Credits*

An in-depth exploration of a subject of special interest to both the student and faculty member. Can be repeated as topic varies. Permission must be obtained in writing from the faculty mentor and the Dean of the College prior to registration. Restricted enrollment. Prerequisites: Junior standing and approval of the instructor.

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## **Subject - Management (MGMT) —**

### **240 - MANAGEMENT INFORMATION SYSTEMS**

*4.00 Credits*

The development, design and implementation of management information systems with introduction to the terminology, concepts and trends in computer hardware and software. Prerequisite: ABUS 201.

### **291 - SPECIAL TOPICS IN MANAGEMENT**

*1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **292 - CROSS-CULTURAL MANAGEMENT**

*4.00 Credits*

An examination of the application of societal and corporate culture and its consequences in managerial and organizational settings in Western Europe. Convergency with and divergency from American corporate culture will be explored. Prerequisite: Participation in a college sponsored summer business tour. (Also listed as IBEC 292.)

### **325 - EMPLOYMENT LAW**

*4.00 Credits*

The legal relationship between employers and employees. Topics include the basic laws regulating labor relations, employment discrimination, workers' compensation and disability payments, occupational safety and health, employment, and unemployment compensation, termination of employment, and retirement. Prerequisite: ABUS 312.

### **333 - MANAGEMENT AND ORGANIZATIONAL BEHAVIOR**

*4.00 Credits*

Modern management concepts with emphasis on the human factors in organizations. Historical foundations of managerial problems, investigation of individual, group and organizational processes including current management issues. (Formerly offered as MGMT 330 and MGMT 335) Prerequisite: Junior standing.

**334 - CASES AND EXERCISES IN ORGANIZATIONAL BEHAVIOR**

*4.00 Credits*

Experiential and case-based approach to managing organizational behavior. Prerequisite: MGMT 333.

**363 - HUMAN RESOURCE MANAGEMENT**

*4.00 Credits*

Analysis of the role of human resources in contemporary organizations. Functions performed by the human resource practitioner in the areas of recruitment, training and development, compensation, employee relations, health and safety, and employee separation. The impact of government regulations. Prerequisite: MGMT 333.

**364 - PRODUCTION AND OPERATIONS MANAGEMENT**

*4.00 Credits*

Major issues and analytical problem solving techniques existing in the field of production and operations management. The design of production systems, operation, coordination and control of production activity in the context of minimum cost attainment. Prerequisites: STAT 146, MGMT 333 and junior standing.

**380 - PRINCIPLES OF ELECTRONIC COMMERCE**

*4.00 Credits*

Connection of business systems via the Internet directly to critical constituencies: customers, employees, vendors, and suppliers. Electronic commerce and its dimensions, benefits, limitations, and process. Electronic commerce infrastructure and major applications of electronic commerce. Prerequisites: ABUS 201, MGMT 333 and MRKT 351.

**400 - CURRENT LABOR RELATIONS**

*4.00 Credits*

Managerial and organizational aspects arising out of employer/union relations. The evolution of labor relations, current labor law, negotiation and administration of labor agreements, and labor relations in the public sector as well as in foreign countries. Open to seniors only. Offered alternate years. Prerequisite: MGMT 363.

**410 - BUSINESS AND SOCIETY**

*4.00 Credits*

The complex and dynamic interrelationships between business and society: the social, cultural, legal, ethical, economic and technological issues, philosophies and points of view which influence business. Issues of corporate responsibility, individual rights and multi-national business. Prerequisite: MGMT 333.



## **425 - INTERNSHIP IN MANAGEMENT**

*1.00 to 16.00 Credits*

Field experience in management. Graded S/U. Internship experiences can be repeated for a maximum of sixteen credit hours. Can be used only as general elective hours and can not be used to satisfy either management or business elective requirements. Consult advisor.

## **474 - SMALL BUSINESS MANAGEMENT**

*4.00 Credits*

The importance of small business, its current status, problems encountered and requirements for successful operations. Emphasis on problem solving techniques for small businesses. Prerequisites: ABUS 312, MGMT 333, MRKT 351, FINC 362 and STAT 146.

## **485 - BUSINESS POLICY AND STRATEGY**

*4.00 Credits*

Integrative capstone course designed to provide students with an awareness of the roles and responsibilities of managers as they formulate and implement direction for their organizations in an ever changing environment. Case study is emphasized. Prerequisites: Senior standing and ABUS 312, MGMT 333, MRKT 351 and FINC 362.

## **486 - INTERNATIONAL MANAGEMENT**

*4.00 Credits*

The application of management concepts and techniques in a multinational environment. The meaning of culture as it applies to international management. Issues in international human resource management. A focus on relevant simulations and cases. Prerequisites: FINC 362, IBEC 300, MGMT 333, and MRKT 351. (Also listed as IBEC 486.)

## **491 - SPECIAL TOPICS IN MANAGEMENT**

*1.00 to 4.00 Credits*

Can be repeated as the topic varies.

## **498 - INDEPENDENT STUDY IN MANAGEMENT**

*1.00 to 4.00 Credits*

An in-depth exploration of a subject of special interest to both the student and the faculty member. Can be repeated as topic varies. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the College prior to registration. Prerequisite: Junior standing and approval of the instructor.

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## **Subject - Marketing (MRKT)**

### **351 - PRINCIPLES OF MARKETING**

*4.00 Credits*

Product design and planning, promotional activities, pricing strategy, aspects of physical distribution, retailing, market research and buyer behavior. Strategic marketing, planning and control, ethics and international marketing. Prerequisite: Junior standing.

### **360 - PROMOTION MANAGEMENT**

*4.00 Credits*

Management of the promotion mix and how its elements can be integrated to solve marketing communication problems. Specific topics include: advertising, personal selling, sales promotion, direct marketing, internet marketing and public relations. Prerequisite: MRKT 351.

### **370 - RETAILING**

*4.00 Credits*

Retail store formats, trading area analysis, store location and design, inventory evaluation and management, pricing strategies, sales promotion, merchandise planning, procurement and selling functions. Prerequisite: MRKT 351.

### **371 - PERSONAL SELLING**

*4.00 Credits*

Aspects of the behavioral approach to selling in the context of the marketing concept. Selling techniques which build long term customer relationships. Prospecting, ethics, qualifying, presenting, product demonstrations, handling objections, closing and follow up techniques, and international selling. Prerequisite: MRKT 351.

### **372 - ADVERTISING**

*4.00 Credits*

Advertising as an integral part of the marketing process. An overview of agency operation, media strategy, print and electronic media, and copy creation and concepts. Cases are used to illustrate how organizations develop advertising strategies. An advertising plan must be developed for an organization using the principles of the course. Offered alternate years. Prerequisite: MRKT 351.

### **373 - LOGISTICS**

#### *4.00 Credits*

Move-storage activities that are necessary to deliver products to the right place, at the desired time, in the appropriate condition and at the lowest cost. Warehousing, transportation, order processing, inventory and material handling are key topics. Emphasis is given to the development of decision skills which will provide the best minimum total cost service to the customer. Offered alternate years. Prerequisites: MGMT 333 and MRKT 351.

### **376 - BUSINESS TO BUSINESS MARKETING**

#### *4.00 Credits*

Basic business marketing systems as distinguished from consumer marketing. Characteristics of manufacturer's goods, channels of distribution, pricing, vendor and value analysis, commercial buying, advertising, and meeting product specifications. Prerequisite: MRKT 351.

### **420 - INTERNSHIP IN MARKETING**

#### *1.00 to 16.00 Credits*

Field experience in marketing. Graded S/U. Internship experiences can be repeated for a maximum of sixteen credit hours. Can be used only as general elective hours and can not be used to satisfy either marketing or business elective requirements. Consult advisor.

### **434 - MARKETING RESEARCH**

#### *4.00 Credits*

Research design, data collection methods, sampling techniques, tabulation, analysis and presentation of information concerning problems in marketing. Provides a working knowledge of the concepts and methods of marketing research. Offered alternate years. Prerequisite: MRKT 351 and STAT 142, or 146 or 156.

### **452 - CONSUMER BEHAVIOR**

#### *4.00 Credits*

Determinants of behavior which influence the purchase of goods and services. Consumer characteristics, situation analysis and product attributes are key topics covered in this area of behavior. Sociological, cultural, psychological, economic and communication theories used to create unique marketing mixes for specialized target markets. Offered alternate years. Prerequisite: MRKT 351.

### **453 - INTERNATIONAL MARKETING**

#### *4.00 Credits*

World markets, their respective consumers and environments, and the marketing management required to meet the demand of world markets in a dynamic and ever changing setting. Contrasting marketing in the United States with marketing in foreign countries. Case studies illustrate marketing problems faced by international marketers. Prerequisites: IBEC 300 and MRKT 351. (Also listed as IBEC 453.)

### **455 - ADVANCED MARKETING**

#### *4.00 Credits*

Integrative capstone in marketing which brings together all of the functional areas of marketing and requires development of marketing strategies and their application to problem situations. A group case approach is used. Open to seniors only. Offered alternate years. Prerequisites: MRKT 351, 370 and 434; MGMT 333; and FINC 362.

### **493 - SPECIAL TOPICS IN MARKETING**

#### *1.00 to 4.00 Credits*

Can be repeated as the topic varies.

### **496 - INDEPENDENT STUDY IN MARKETING**

#### *1.00 to 4.00 Credits*

An exploration in depth of a subject of special interest to both the student and the faculty member. Can be repeated as the topic varies. Prerequisites: Junior standing and approval of the instructor. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the college prior to registration.





# THE THOMAS JEFFERSON SMULL COLLEGE OF Engineering

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## Barry J. Farbrother, *Dean*

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### Accreditation and Association

Bachelors degree programs in civil, computer, electrical and mechanical engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). The College is a member of the American Society for Engineering Education and the Association for Computing Machinery and is recognized by the Ohio Board of Registration for Professional Engineers and Surveyors.

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### History and Tradition

In 1871 the first catalog of the University included a course in surveying. A department of Civil Engineering was organized in 1880 with its first graduate in 1882, Electrical Engineering in 1898, and Mechanical Engineering in 1904. The Electrical and Computer Engineering department was formed in 1998 and in 2001 the department of Electrical & Computer Engineering and Computer Science was established. Over 4,000 engineers have graduated from the Thomas Jefferson Smull College of Engineering. All programs continue to meet the highest standards of engineering excellence.

The tradition of the College is to treat each student as an individual, to keep class size small, and to maintain a close faculty- student relationship.

The following faculty chairs have been established to enhance the educational tradition of the college.

**Herbert F. Alter Chair of Engineering Science** established in 1983 by Mrs. Alter in memory of her late husband, class of 1911 in mechanical engineering. The 2002-03 recipient is Dr. Les Thede, professor of electrical and computer engineering.

**Engineering Alumni Chair** established in 1983 by donations from engineering alumni and friends in celebration of the college's centennial year. The 2002-03 recipient of the chair is Dr. Robert Ward, 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 2002-03 recipient of the chair is Dr. Jed Marquart, associate professor of mechanical engineering.

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### Departments

There are three departments in the College of Engineering: **civil engineering, electrical & computer engineering and computer science, and mechanical engineering.**

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### Vision Statement

The vision of the T.J. Smull College of Engineering is to be recognized as a premier undergraduate engineering college.

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### Mission Statement

The mission of the College of Engineering of Ohio Northern University is to provide the highest quality undergraduate engineering programs in an environment that supports student endeavors, encourages faculty scholarship and provides for the personal growth of all community members. We aspire to provide a teaching/learning environment that maximizes opportunities for student success. By instilling broad problem solving, design, and social skills, encouraging service to society, ethical behavior, and career-long learning, we prepare students for satisfying careers in which they can contribute to the betterment of society. We expect this preparation will enable graduates to become highly regarded throughout their professional careers, thereby bringing recognition to themselves and the institution. Toward this end we will:

- Maximize learning by incorporating new and effective pedagogical methods
- Develop leading edge curricula which are based on fundamentals
- Be responsive to technological advances
- Be adaptive to our industrial and student clients
- Prepare graduates who possess professional, technical and social skills
- Create a positive environment for the critical evaluation of new ideas

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## Guiding Principles

The College of Engineering is committed to the guiding principles below. Community members:

- will exhibit dignity, integrity, respect, and professionalism
- will assist all members of the College of Engineering - students, staff, and faculty to achieve their full potential
- will instill a spirit of pride, cooperation, and accountability
- believe that personal contact with, and concern for, our students are essential
- have a passion for the total development of the student
- recognize that in diversity there can be strength
- are committed to providing engineering programs of the highest quality, which provide breadth, and incorporate theoretical and experiential components
- are committed to career-long learning and service to society
- recognize that the College of Engineering is one component of the educational environment, and will offer support for other programs within the university.

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## Admission Standards

Early application is advisable. Students interested in engineering or computer science are encouraged to obtain advice on programs 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 must have 16 acceptable units of work. For engineering students, ten of these units are as follows: 4 units in English; 4 units in mathematics (2 units in algebra, 1 unit in geometry, and at least 0.5 units in trigonometry or its equivalent); and 2 units in science (1 unit in physics and preferably 1 unit in chemistry). For computer science students, fourteen of these units are as follows: 4 units in English; 4 units in mathematics as above; 6 units (in any combination) in history, social studies, languages or natural sciences. The college recommends but does not require that applicants have two units of a foreign language. The general minimum entry requirement is an ACT composite score of 20 with no individual score below 20.

Students entering the college of engineering should demonstrate strength in mathematics, preferably above the ACT 25 level.

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 advanced 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 accept transfer credits earned with a grade of C or better (C- is not acceptable). A maximum of 150 hours of transfer work will be accepted.

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## Degree Requirements

### **Bachelor of Science degree in civil, computer, electrical or mechanical engineering.**

#### **General Education Requirements**

All engineering majors are required to complete a general education requirement. The ONU requirement includes specific courses and electives in the Humanities and Social Sciences: Writing 1 (ENGL 110), Writing 2 (ENGL 111), Ethics (PHIL 336), Religion Elective (1), Microeconomics (IBEC 202), Social Science Electives (2), Humanities Elective (1), Humanities/Social Science Elective (1).

Each student should consider carefully the selection of electives for the general education requirements. While the student is given choices in this selection it is mandatory that these choices be discussed and approved by the academic advisor.

Because the courses available change from year to year, they are not listed in this catalog. See the current *schedule of courses* published by the registrar.

An approved Honors Seminar may fulfill a requirement listed above. For specific information, see the office of the dean.

#### **Bachelor of Science in Civil Engineering Curriculum**

##### *First Year*

Calculus 1, 2, 3 (MATH 163-64-65)	13 hours
Physics: Mech. & Lab (PHYS 231-34)	5 hours
Physics: H/L/S & Lab (PHYS 232-35)	5 hours
Freshman Enrichment (GE 100.01)	1 hour

Fund. of Engineering (GE 101)	3 hours
Engin. Prob. Solving & CAD (GE 102)	3 hours
Statics (GE 113)	4 hours
Writing 1, 2 (ENGL 110-11)	8 hours
General Education	8 hours
<b>TOTAL</b>	<b>50 hours</b>

*Second Year*

Calculus 4 (MATH 263)	4 hours
Linear Algebra (MATH 272)	4 hours
Differential Equations (MATH 275)	5 hours
Physics: E/M & Lab (PHYS 233-36)	5 hours
Chemistry (CHEM 162-3)	8 hours
Lab for CHEM 163 (CHEM 165)	0 hours
Dynamics (GE 214)	4 hours
Circuits 1 (GE 201)	5 hours
Strength of Materials (GE 223)	4 hours
Engineering Material Science (GE 243)	4 hours
Surveying (CE 203)	4 hours
General Education	4 hours
<b>TOTAL</b>	<b>51 hours</b>

*Third Year*

Numerical Methods (CE 313)	4 hours
Environmental Science (CE 321)	4 hours
Geotechnical Engineering (CE 333)	4 hours
Structures 1,2 (CE 341-2)	9 hours
Reinforced Concrete Design (CE 343)	5 hours
Transportation 1,2 (CE 351-2)	8 hours
Fluid Mechanics (CE 362)	4 hours
Hydraulics (CE 363)	4 hours
Statistics for Scientists and Engineers (STAT 280)	4 hours
General Education	4 hours
<b>TOTAL</b>	<b>50 hours</b>

*Fourth Year*

Project Management (CE 414)	4 hours
CE Design (CE 410)	2 hours
CE Project (CE 415)	4 hours
Soil Mechanics (CE 434)	4 hours
Foundations (CE 438)	4 hours
Steel Design (CE 444)	4 hours
Transportation 3 (CE 456)	4 hours
Hydrology (CE 464)	4 hours
Environmental Engineering 1 (CE 425)	4 hours
CE Elective	4 hours
Ethics In Professional Life (PHIL 336)	4 hours
General Education	8 hours
<b>TOTAL</b>	<b>50 hours</b>

**Bachelor of Science in Electrical Engineering Curriculum**

A list of electives is available from the department office of Electrical & Computer Engineering and Computer Science.

**Electrical Engineering**

*First Year*

Calculus 1, 2, 3 (MATH 163-64-65)	13 hours
Physics: Mech. & Lab (PHYS 231-34)	5 hours
Physics: H/L/S and Lab (PHYS 232-35)	5 hours
Freshman Enrichment (GE 100.02)	1 hour
Fund. of Engineering (GE 101)	3 hours
Engin. Prob. Solving & CAD (GE 102)	3 hours
Statics (GE 113)	4 hours
Writing 1, 2 (ENGL 110-11)	8 hours
Prin. of Microeconomics (IBEC 202)	4 hours
Religion Elective	4 hours
<b>TOTAL</b>	<b>50 hours</b>

*Second Year*

Linear Algebra (MATH 272)	4 hours
Discrete Math (MATH 336)	4 hours
Differential Equations (MATH 275)	5 hours
Physics: E/M & Lab (PHYS 233-36)	5 hours
Circuits 1, 2 (GE 201-02)	9 hours
Signals and Systems 1 (ECCS 203)	4 hours
Ethics in Professional Life (PHIL 336)	4 hours
Programming 1 (ECCS 164)	4 hours
Calculus 4 (MATH 263)	4 hours
Dynamics (GE 214)	4 hours
Social Science Elective	4 hours
<b>TOTAL</b>	<b>51 hours</b>

*Third Year*

Chemistry 1 (CHEM 162)	4 hours
Chemistry 2 and Lab (CHEM 163-65)	4 hours
Signals and Systems 2 (ECCS 301)	4 hours
Filter Design (ECCS 323)	4 hours
Digital Electronics (ECCS 361)	5 hours
Microprocessors (ECCS 362)	4 hours
Analog Electronics 1, 2 (ECCS 321-22)	8 hours
Electromagnetics (ECCS 331)	5 hours
Energy Conversion (ECCS 335)	4 hours
Power Systems (ECCS 336)	4 hours
Humanities Elective	4 hours
<b>TOTAL</b>	<b>50 hours</b>

*Fourth Year*

Statistics for Engineers (STAT 280)	4 hours
Senior Design Seminar (ECCS 404)	1 hour
Senior Design (ECCS 405)	4 hours
Engineering Tech. Comm. (ECCS 406)	3 hours
Digital Signal Processing (ECCS 411)	4 hours
Engineering Economy (ECCS 472)	4 hours
Control Systems 1, 2 (ECCS 444-45)	8 hours
Commun. Systems 1, 2 (ECCS 458-59)	8 hours
Technical Elective	4 hours
ECCS Elective	3 hours
Humanities/Social Sciences	8 hours
<b>TOTAL</b>	<b>51 hours</b>

## Bachelor of Science in Computer Engineering Curriculum

A list of electives is available from the department office of Electrical & Computer Engineering and Computer Science.

### First Year

Calculus 1, 2, 3 (MATH 163-64-65)	13 hours
Physics: Mech. & Lab (PHYS 231-34)	5 hours
Physics: H/L/S and Lab (PHYS 232-35)	5 hours
Freshman Enrichment (GE 100.02)	1 hour
Fund. of Engineering (GE 101)	3 hours
Engin. Prob. Solving & CAD (GE 102)	3 hours
Statics (GE 113)	4 hours
Writing 1, 2 (ENGL 110-11)	8 hours
Prin. of Microeconomics (IBEC 202)	4 hours
Religion Elective	4 hours
<b>TOTAL</b>	<b>50 hours</b>

### Second Year

Linear Algebra (MATH 272)	4 hours
Discrete Math (MATH 336)	4 hours
Differential Equations (MATH 275)	5 hours
Physics: E/M & Lab (PHYS 233-36)	5 hours
Circuits 1, 2 (GE 201-02)	9 hours
Signals and Systems 1 (ECCS 203)	4 hours
Ethics in Professional Life (PHIL 336)	4 hours
Programming 1, 2, 3 (ECCS 164-65-66)	12 hours
Assm Lang & Comp Org (ECCS 264)	4 hours
<b>TOTAL</b>	<b>51 hours</b>

### Third Year

Chemistry 1 (CHEM 162)	4 hours
Chemistry 2 and Lab (CHEM 163-65)	4 hours
Signals and Systems 2 (ECCS 301)	4 hours
Filter Design (ECCS 323)	4 hours
Digital Electronics (ECCS 361)	5 hours
Microprocessors (ECCS 362)	4 hours
Adv. Digital Electronics (ECCS 363)	4 hours
Data Structures (ECCS 268)	4 hours
Computer Architecture (ECCS 365)	4 hours
Operating Systems (ECCS 466)	4 hours
Dynamics (GE 214)	4 hours
Social Science Elective	4 hours
<b>TOTAL</b>	<b>49 hours</b>

### Fourth Year

Statistics for Engineers (STAT 280)	4 hours
Senior Design Seminar (ECCS 404)	1 hour
Senior Design (ECCS 405)	4 hours
Engineering Tech. Comm. (ECCS 406)	3 hours
Digital Signal Processing (ECCS 411)	4 hours
Engineering Economy (ECCS 472)	4 hours
Compilers (ECCS 468)	4 hours
Networks and Data Comm. (ECCS 366)	4 hours
Software Engineering (ECCS 464)	4 hours
Computer Device Lab (ECCS 467)	4 hours
Software Elective	4 hours
Humanities/Social Sciences	12 hours
<b>TOTAL</b>	<b>52 hours</b>

## Bachelor of Science in Mechanical Engineering Curriculum

### First Year

Calculus 1, 2, 3 (MATH 163-64-65)	13 hours
Physics: Mech. & Lab (PHYS 231-34)	5 hours
Physics: H/L/S & Lab (PHYS 232-35)	5 hours
Freshman Enrichment (GE 100.03)	1 hour
Fund. of Engineering (GE 101)	3 hours
Engin. Prob. Solving & CAD (GE 102)	3 hours
Statics (GE 113)	4 hours
Writing 1, 2 (ENGL 110-11)	8 hours
Prin. of Microeconomics (IBEC 202)	4 hours
General Education	4 hours
<b>TOTAL</b>	<b>50 hours</b>

### Second Year

Calculus 4 (MATH 263)	4 hours
Linear Algebra (MATH 272)	4 hours
Differential Equations (MATH 275)	5 hours
Physics: E/M & Lab (PHYS 233-36)	5 hours
Chemistry (CHEM 162-63)	8 hours
Lab for CHEM 163 (CHEM 165)	0 hours
Dynamics (GE 214)	4 hours
Circuits 1 (GE 201)	5 hours
Circuits 2 (GE 202)	4 hours
Strength of Materials (GE 223)	4 hours
Engineering Material Science (GE 243)	4 hours
Computer Applications and Design (ME 202)	4 hours
<b>TOTAL</b>	<b>51 hours</b>

### Third Year

Process of Mech. Design (ME 311)	4 hours
Adv. Strength of Materials (ME 319)	4 hours
Manufacturing Processes (ME 341)	4 hours
Mechanisms (ME 352)	5 hours
Thermodynamics (ME 362)	4 hours
Thermodynamics of Fluids (ME 363)	5 hours
Numerical Methods (ME 371)	4 hours
Engineering Analysis (ME 382)	4 hours
Finite Element Analysis (ME 383)	4 hours
Public Speaking (COMM 211)	4 hours
General Education	4 hours
Statistics for Scientists and Engineers (STAT 280)	4 hours
<b>TOTAL</b>	<b>50 hours</b>

### Fourth Year

Capstone 1, 2, 3, (ME 411-2-3)	4 hours
Mechanical Design of Components (ME 417)	4 hours
Fluid Mechanics (ME 464)	5 hours
Heat Transfer 1, 2 (ME 467-8)	9 hours
Technical Elective	4 hours
Control Systems (ME 419)	5 hours
Vibration Analysis (ME 418)	4 hours
Ethics in Prof. Life (PHIL 336)	4 hours
General Education	12 hours
<b>TOTAL</b>	<b>51 hours</b>

- \* A student must receive a passing grade in courses that are listed for graduation.
- \*\* Students need to take the courses listed for their class level for the 2003-04 academic year. They are subject to change in subsequent years.

## Bachelor of Science - Computer Science Curriculum

### General Education Requirements:

ENGL 110, 111 and 204, HIST 110 and 111, COMM 211 or 225, two additional social science **elective** courses, one fine arts **elective** course, one religion **elective** course, one philosophy **elective** course, four science **elective** courses, and one **elective** course in non-Western culture. A list of electives is available from the department office of Electrical & Computer Engineering and Computer Science. An approved Honors Seminar may fulfill a requirement listed above.

#### First Year

Freshman Enrichment (GE 100.04)	1 hour
Programming 1,2,3 (ECCS 164-165-166)	12 hours
Calculus 1,2 (MATH 163-164)	9 hours
Writing 1,2 (ENGL 110-111)	8 hours
Western Civ. 1,2 (HIST 110-111)	8 hours
Religion Elective	4 hours
Fine Arts Elective	4 hours
<b>TOTAL</b>	<b>46 hours</b>

#### Second Year

Programming Env. (ECCS 228)	4 hours
Assembly Language (ECCS 264)	4 hours
Data Structures (ECCS 268)	4 hours
Discrete Math (MATH 336)	4 hours
Linear Algebra (MATH 272)	4 hours
Great Works (ENGL 204)	4 hours
Science Elective 1,2,3	12 hours
Computer Science Elec (ECCS 2XX)	4 hours
General Electives	8 hours
<b>TOTAL</b>	<b>48 hours</b>

#### Third Year

Foundations of CS (ECCS 448)	4 hours
Digital Logic (ECCS 360)	4 hours
Computer Architecture (ECCS 365)	4 hours
Operating Systems (ECCS 466)	4 hours
Computer Science Elec (ECCS 3XX)	8 hours
Statistics (STAT 280)	4 hours
Science Elective 4	4 hours
Social Science Elec 1,2	8 hours
General Electives	8 hours
<b>TOTAL</b>	<b>48 hours</b>

#### Fourth Year

Compilers (ECCS 468)	4 hours
Software Engineering (ECCS 464)	4 hours
Org. Prog. Lang (ECCS 330)	4 hours

Sr. Design Sem. (ECCS 404)	1 hour
Senior Design (ECCS 405)	4 hours
Eng Tech Comm (ECCS 406)	3 hours
Communications (COMM 211 or 225)	4 hours
Philosophy Elective	4 hours
Non-Western Elective	4 hours
General Electives	8 hours
<b>TOTAL</b>	<b>40 hours</b>

**TOTAL** 182 hours

### Requirements for the Computer Science Minor

Programming 1,2,3 (ECCS 164-165-166)	12 hours
Computer Science Elec (ECCS 2XX)	4 hours

The student must also complete three additional courses (4 credit hours each) in computer science, with at least one course at the 300 or 400 level.

Electrical Engineering students may count ECCS 361 and ECCS 362 as computer science electives.

Mechanical Engineering students may count ME 202 and ME 371 as computer science electives.

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## Graduation Requirements

A student qualifies for graduation by meeting specific course requirements as listed in the catalog year by year for the specific program at specific levels and by earning a minimum number of academic hours as defined by their particular program. In addition, a student must attain at least a 2.00 cumulative grade point average in all courses and at least a 2.00 cumulative grade point average in all engineering and computer science courses.

All degree candidates are required to spend their senior year in academic residence.

At commencement engineering students receive the bachelor of science degree in either civil, computer, electrical, or mechanical engineering. Computer science students receive the bachelor of science degree.

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## General Regulations

Each department in the college lists quarter by quarter the standard course load for a student. The normal maximum load is that which is listed by the department for that quarter at that level or 19 hours, whichever is larger. The dean, upon recommendation of the student's advisor, may permit a student to enroll for extra hours at an additional charge. See page 18 for overload charges beyond 19 credit hours. The normal requirement is a cumulative average of at least 3.00/4.00. Except where noted, credit hours earned in repeated courses can be counted only one time among the total hours required for graduation.

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## S/U Grade Option

Students in the College of Engineering are not permitted to register for courses on an S/U (satisfactory/unsatisfactory) basis if the course is offered on a graded basis.

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## Classification of Students

For purposes of classification, the minimum requirements for sophomore standing are 49 quarter credit hours (45 computer science program) of completed academic work; for junior standing, 98 quarter credit hours (90 computer science); and for senior standing, 147 quarter credit hours (135 computer science).

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## Academic Standing

A student is in good academic standing when the cumulative grade point average is equal to or greater than 2.00. When the cumulative grade point average falls below 2.00, a student is placed on probation. Normally, one quarter is given to raise the cumulative average to 2.00 or above. The status of probation may occur for two successive quarters if conditions and evidence indicate that the student is improving academically. Students on probation cannot participate in competitive activities of individuals, teams, or other groups officially designated as representing the University.

Any student on probation whose quarter grade point average for the following quarter is below a 2.00 will have his/her record reviewed by the Committee on Academic Qualifications of the college and may be recommended to the dean for academic actions which may include suspension or dismissal. Unless otherwise indicated, suspension is for a period of three regular academic quarters. Students who have been suspended must petition the academic dean for lifting of the suspension.

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## 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. ONU senior engineering students are strongly encouraged to take the Fundamentals of Engineering (FE) exam which is offered in April each year. Typically 90%+ of graduating seniors take the exam and 90%+ pass the exam. The dean gives full information to students in their

senior year. Students may also write the Secretary of the State Board of Registration for Professional Engineers and Surveyors, 77 South High Street, 16th Floor, Columbus, OH 43266-0314.

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## Engineering Graduates and Law School

Graduating seniors of the Smull College of Engineering interested in entering the Pettit College of Law at Ohio Northern should refer to the program description material on page 33 of this catalog.

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## Dual Degree Programs

Information concerning dual degree programs involving the College of Engineering appears on page 33 of this catalog. Students pursuing such a program are required to take advanced mathematics in the first year. Students may receive further details in the office of the dean of the college.

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## Cooperative Education Program

Cooperative education is a plan of educational development designed to integrate classroom study with planned and supervised work experiences. Engineering and computer science co-op students normally are employed in semiprofessional capacities in research, development, manufacturing, and engineering departments of industrial companies, consulting firms, and in federal and state agencies. The program also includes the opportunity for the students to work for an international firm in an international environment. The international co-op component is modified to include courses in the appropriate language and culture and a six-month overseas assignment during the junior year. The employment sessions begin in the summer following the sophomore year and include a contracted four to six terms of co-op experience. This five-year program is optional and currently available for civil, computer, electrical, and mechanical engineering students and computer science students.

In fall 2001, the college of engineering initiated the Engineer-in-Residence program. A professional engineering office located within the college of engineering and supervised by a practicing engineer allows students to obtain professional work experience throughout the academic year. Competition for these positions is high, since these remunerated appointments make it possible for students to complete the cooperative education program and graduate in four years.

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## Interdisciplinary Programs

In addition to the regular degree programs in civil, computer, electrical, and mechanical engineering and the computer science major, several interdisciplinary programs have been developed. They are a Business Administration Minor or Option, a Computer Science Minor, a Bio-Medical Option, a Bio-Medical Sciences Minor, and an Environmental Option, among others. The Business Administration Option may be taken with any of the college of engineering degree programs. The Computer Science Minor is available to all except Computer Engineering and Computer Science majors; the Bio-Medical Option is designed to be taken with either the electrical or computer engineering program; the Bio-Medical Sciences Minor is designed to be taken with the mechanical engineering program; and the Environmental Option complements the civil and mechanical engineering programs.

This is accomplished by proper planning and judicious use of social science and technical electives. Further, it is accomplished without a sacrifice in the engineering content of the four degree programs. In order to avoid scheduling conflicts, it is essential that the student follow the program as designated. A copy of each of the interdisciplinary programs may be obtained from the respective departmental offices. Any student may select one of the programs as an adjunct to the engineering degree program with the approval of the appropriate chair and the dean. In order for the student to continue in the program the cumulative average must be at least 2.50. Additional hours in the minor or option are required for graduation. Pursuit of an option or minor may involve several quarters where loads exceed 19 quarter hours and/or summer sessions. In such cases, a course overload fee is required for academic work in excess of 19 hours. (See page 18.) A minimum of 28 hours in the minor or option is required for graduation. The diploma does not indicate the minor or option; however, the transcript does show the appropriate program designation.

Courses required for the **Business Administration Option** are two courses in economics, two courses in accounting, one course in business law, and two business electives.

The **Bio-Medical Option** requires a three-course sequence in introductory biology, zoology, and anatomy; a two course intermediate level sequence in anatomy/physiology; and two technical electives chosen from a specific list of courses. (Contact the Electrical & Computer Engineering and Computer Science department office for the list of possible electives).

The **Bio-Medical Sciences Minor** requirements are determined by the Department of Biological Sciences.

The **Environmental Option** includes two courses in the biological sciences, two in chemistry and five courses in civil engineering which focus on various aspects of the environment.

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## GENERAL ENGINEERING COURSES

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### **Subject - General Engineering (GE)**

#### **100 - FRESHMAN ENRICHMENT**

*1.00 Credit*

The practices, methods, and procedures which are common to problems and designs encountered in engineering. To form a strong bond between the student and department and provide a forum for freshman advising. Graded S/U. Offered Fall Quarter.

#### **101 - FUNDAMENTALS OF ENGINEERING (3+0)**

*3.00 Credits*

Emphasis on the engineering profession. Includes computer skills, professionalism, ethics, applications of math and physics to engineering projects emphasizing working in teams. Offered Fall Quarter.

#### **102 - ENGINEERING PROBLEM SOLVING AND CAD (2+2)**

*3.00 Credits*

Includes mechanical drawing techniques done by hand and using CAD. Teams work to complete a design project from proposal to presentation. Prerequisite: GE 101. Offered Winter Quarter.

#### **113 - STATICS (4+0)**

*4.00 Credits*

Fundamental principles of statics with vector methods. Emphasis on free body diagrams and equations of equilibrium. Topics include resultants of force systems, centroids, centers of gravity, moments of inertia, equilibrium, shear and moment diagrams, loads, trusses, and internal forces. Prerequisites: MATH 163 and PHYS 231. Offered Spring Quarter.

#### **180 - SPECIAL TOPICS**

*1.00 to 4.00 Credits*

Selected topics of current interest in general engineering. Prerequisite: Permission of instructor.



### **190 - INDEPENDENT STUDY**

*1.00 to 4.00 Credits*

Individual study of topic of particular interest to the student in general engineering. Prerequisite: Permission of instructor.

### **201 - CIRCUITS 1 (4+2)**

*5.00 Credits*

DC Circuit Analysis. Ohm's Law. Kirchoff's Laws. Dependent Sources. Nodal and Loop Analysis. Op-Amps. Network Theorems. Single-time constant circuits. P-Spice. Circuit Tutor. Prerequisite: MATH 164. Offered Fall Quarter.

### **202 - CIRCUITS 2 (3+2)**

*4.00 Credits*

Network Theorems (AC Applications). Power. Three-Phase Circuits. Mutual Inductance. P-Spice. Circuit Tutor. Prerequisite: GE 201. Offered Winter Quarter.

### **214 - DYNAMICS (4+0)**

*4.00 Credits*

Fundamental principles of mechanics with vector methods as applied to dynamics. Topics include: kinematics, absolute and relative motion, force, mass and acceleration, work and energy, and impulse and momentum. Prerequisites: MATH 164 and GE 113. Offered Fall and Winter Quarters.

### **223 - STRENGTH OF MATERIALS (4+0)**

*4.00 Credits*

Elastic analysis of deformable bodies using concepts of stress and strain. Topics include: members subject to tension, compression, torsion, and flexure; development and application of Mohr's circle, determinate beam deflection, material properties, pressure vessels, and composite beams. Prerequisite: GE 113. Offered Winter Quarter.

### **243 - ENGINEERING MATERIAL SCIENCE (3+2)**

*4.00 Credits*

Fundamental chemical, physical and microstructural characteristics of materials and how these relate to their mechanical behavior. Evaluation of these properties for material selection. Metallurgical aspects including equilibrium diagrams. Includes laboratory experiments in Mechanics of Materials and Material Science. Offered Spring Quarter.

### **250 - ORIENTATION FOR CO-OP STUDENTS (1+0)**

*.00 Credits*

An introduction to the co-op program. Includes an introduction to industry, the industrial work environment, resume writing, interviewing and job search techniques. Designed to prepare the sophomore engineering student for the industrial experience. Prerequisite: Sophomore standing. Offered Fall Quarter.

### **280 - SPECIAL TOPICS**

*1.00 to 4.00 Credits*

Selected topics of current interest in general engineering. Prerequisite: Permission of instructor.

### **290 - INDEPENDENT STUDY**

*1.00 to 4.00 Credits*

Individual study of topic of particular interest to the student in general engineering. Prerequisite: Permission of instructor.

### **350 - PROFESSIONAL PRACTICE**

*1.00 Credit*

Employment in a semi-professional capacity in a research, development, manufacturing, or engineering department of an industrial company, a consulting firm or a governmental agency. A student report on the assignment and an employer's evaluation are required. May be repeated up to a total of six hours. Prerequisites: Junior standing, successful completion of GE 250, and CUM GPA of 2.5 minimum.

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## **DEPARTMENT OF CIVIL ENGINEERING**

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Professors Smalley (*Chair*), Ward; Associate Professor Bazlamit; Assistant Professors Berdanier, Reza

### **Mission Statement**

The mission of the civil engineering department is to provide an overall scholarly, collegial, and professional atmosphere of undergraduate education by which students are prepared for careers in civil engineering.

To implement the mission, the department will:

- Provide a program that prepares students for entry-level professional employment or advanced studies at the graduate level by offering a curriculum based on a strong background in the fundamentals of engineering, science, and mathematics structured for breadth of coverage of civil engineering principles.
- Provide for areas of concentration, options, minors, and an opportunity for work experience through a cooperative education program.
- Provide for a student body of appropriate quality and size that is active in the community.
- Provide a faculty who excel in undergraduate scholarship and who are active in their profession.
- Provide state-of-the-practice physical facilities, including classrooms, laboratories, and support areas.
- Provide for institutional commitment for support in the areas of administration, financial resources, and institutional facilities.

## Program Educational Objectives

Upon graduation, Civil Engineering students will have:

1. the knowledge and skills necessary for entry-level professional employment in civil engineering or advanced study at the graduate level,
2. an awareness and understanding of their ethical, legal, and professional responsibilities and the impact of civil engineering on society, and a recognition of the need for career-long learning,
3. the ability to communicate effectively.

## Program Outcomes

Each Civil Engineering graduate will:

1. be able to use an engineering methodology to formulate, analyze, and solve engineering problems in sub-discipline areas of civil engineering.
2. be able to use an engineering methodology to design a component, process, or system in sub-discipline areas of civil engineering.
3. demonstrate proficiency in the required mathematics, science, and engineering courses.
4. be able to conduct standard laboratory and field procedures, or to devise procedures when necessary, and to analyze and interpret the resulting data.
5. have experienced an academic environment that promotes professionalism.
6. demonstrate proficiency in required and elective social science and humanities courses.
7. attend meetings, seminars, or workshops of an appropriate professional organization.
8. be able to formulate, draft, and critique technical writing.
9. be able to develop, deliver, and critique oral technical presentations.
10. be able to produce, read, and interpret graphical presentations.

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## Subject - Civil Engineering (CE)

### 203 - SURVEYING (2+4)

*4.00 Credits*

Plane surveying; use of level, distance measurement devices, data collectors, and total stations; traversing, roadway applications, and topographic mapping. Prerequisite: MATH 163. Offered Spring Quarter.

### 313 - NUMERICAL METHODS (4+0)

*4.00 Credits*

Principles of numerical methods used in solving civil engineering problems. Topics include numerical solution of single variable equations, systems of nonlinear equations, integration, differentiation, and differential and partial differential equations by finite differences. Prerequisite: MATH 275. Offered Spring Quarter.

### 321 - ENVIRONMENTAL SCIENCE (3+2)

*4.00 Credits*

Sources and characteristics of pollutants, their effects on the environment, humans, and animals. Emphasis placed on interdisciplinary approach to reduce and treat wastes. Prerequisite: Junior Standing. Offered Fall Quarter.

### 323 - SOLID AND HAZARDOUS WASTE MANAGEMENT (4+0)

*4.00 Credits*

Sources and characteristics of solid and hazardous wastes: collection, transportation, disposal, and environmental laws. Selection of disposal sites and conceptual design of disposal facilities. Prerequisites: CHEM 163 and CE 321.

### 333 - GEOTECHNICAL ENGINEERING (3+2)

*4.00 Credits*

Principles of geologic processes and properties of earth materials pertinent to civil engineering. Terrain and site investigation techniques. Physical characteristics, index properties, classifications, and compaction of soils. Offered Spring Quarter.

### 341 - STRUCTURES 1 (4+2)

*5.00 Credits*

Analysis of determinate beams, trusses, and frames. Load distribution deflections, moving loads, influence lines, cables and arches. Prerequisite: GE 223. Offered Fall Quarter.

### 342 - STRUCTURES 2 (4+0)

*4.00 Credits*

Fundamentals of statically indeterminate structures using classical, approximate, and computer solutions. Prerequisite: CE 341. Offered Winter Quarter.

### 343 - REINFORCED CONCRETE DESIGN (4+2)

*5.00 Credits*

Strength design of beams, columns, slabs, and footings using reinforced concrete. Application of ACI code and specifications to design. Concrete properties. Laboratory on concrete testing. Offered Spring Quarter.

**351 - TRANSPORTATION 1 (4+0)***4.00 Credits*

Components of transportation systems; traffic flow modeling, geometric design of highways, horizontal and vertical curves, drainage and surface runoff using AASHTO procedures.

Prerequisite: CE 203. Offered Fall Quarter.

**352 - TRANSPORTATION 2 (4+0)***4.00 Credits*

Principles of traffic engineering, capacity, and level of service. Capacity analysis of two-lane highways, multi-lane highways, and freeways. Emphasis on intersection analysis and design.

Prerequisite: CE 351. Offered Winter Quarter.

**362 - FLUID MECHANICS (3+2)***4.00 Credits*

Principles of the mechanics of fluids; engineering properties of fluids, fluid statics, fluid dynamics by continuity, momentum and energy principles; steady flow in pipes. Offered Winter Quarter.

**363 - HYDRAULICS (3+2)***4.00 Credits*

Hydraulic analysis of piping systems and hydraulic structures: flow analysis and measurement, friction losses, minor losses, pump design, and water hammer; dimensional analysis and similitude. A water distribution system design is a term project.

Prerequisite: CE 362.

**371 - URBAN PLANNING***4.00 Credits*

Principles of city and regional planning; land use, zoning, subdivision regulations, metropolitan problems and urban development. Topics will cover applications in the transportation planning and the environmental areas. Prerequisite: Junior standing.

**380 - SPECIAL TOPICS***1.00 to 4.00 Credits*

Selected topics of current interest in civil engineering. Prerequisite: Permission of instructor.

**390 - INDEPENDENT STUDY***1.00 to 4.00 Credits*

Individual study of topic of particular interest to the student in civil engineering. Prerequisite: Permission of instructor.

**410 - CE DESIGN SEMINAR***2.00 Credits*

Engineering design process; selection of senior design project; oral and written presentation of project proposal. Prerequisite: CE senior standing. Offered Fall Quarter.

**414 - PROJECT MANAGEMENT (3+2)***4.00 Credits*

Principles of organization, management, and control of civil engineering projects. Topics include present and emerging legal and technical issues, critical path methods, and engineering economics. Prerequisite: Senior standing.

Offered Fall Quarter.

**415 - CIVIL ENGINEERING DESIGN PROJECT***4.00 Credits*

Capstone design project, under the specific guidance of a civil engineering faculty member.

Prerequisite: CE 410. Offered Winter Quarter.

**425 - ENVIRONMENTAL ENGINEERING 1 (4+0)***4.00 Credits*

Physical, chemical, and biological processes in water and wastewater treatment systems and their relationship to the environment.

Prerequisite: CE 363. Offered Winter Quarter.

**426 - ENVIRONMENTAL ENGINEERING 2 (4+0)***4.00 Credits*

Advanced environmental systems analysis.

Topics vary in different years.

**434 - SOIL MECHANICS (3+2)***4.00 Credits*

Principles of the mechanics of soils, settlement, consolidation, shear strength, and two-dimensional seepage. Offered Fall Quarter.

**438 - FOUNDATIONS (4+0)***4.00 Credits*

Analysis and design of foundations, retaining structures and slopes. Offered Winter Quarter.

**444 - STEEL DESIGN (3+2)***4.00 Credits*

Design of beams, columns, tension members, frames and connections using structured steel.

Loads and material properties. Application of AISC code and specifications to design. Offered Fall Quarter.

**446 - STRUCTURAL DESIGN (4+0)***4.00 Credits*

Design of structural projects. Prerequisites: CE 343 and 444.

**456 - TRANSPORTATION 3 (3+2)***4.00 Credits*

Design of pavements for transportation facilities; material properties and their impact on pavement design. Prerequisite: CE 352. Offered Spring Quarter.

## 464 - HYDROLOGY (3+2)

### 4.00 Credits

Estimates of population, water usage, and wastewater generation; the hydrologic cycle, precipitation and streamflow data measurement and analysis; runoff prediction, hydrographs, flood routing, and open channel flow. A design term project is required. Prerequisite: CE 362. Offered Fall Quarter.

## 466 - WATER RESOURCES (3+2)

### 4.00 Credits

Continuation of open channel flow analysis with sewer design and modeling water surface profiles. Groundwater topics of confined and unconfined aquifers, steady and unsteady groundwater hydraulics, aquifer pumping tests, and mathematical groundwater modeling. Prerequisite: CE 464.

## 480 - SPECIAL TOPICS

### 1.00 to 4.00 Credits

Selected topics of current interest in civil engineering. Prerequisite: Permission of instructor.

## 490 - INDEPENDENT STUDY

### 1.00 to 4.00 Credits

Individual study of topic of particular interest to the student in civil engineering. Prerequisite: Permission of instructor. surface runoff using AASHTO procedures. Prerequisite: CE 203. Offered Fall Quarter.

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# DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING AND COMPUTER SCIENCE

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Professors Farbrother (*Dean*), Hovis (*CS Program Director*), Thede; Associate Professors Estell (*Chair*), Herr, Retterer, Vemuru; Assistant Professors Al-Olimat, Ezekiel, Hurtig; Visiting Assistant Professor Luo

### Mission and Purpose Statement

The mission of the electrical & computer engineering and computer science department is to develop graduates who are creative, productive, ethical, and contributing members of society.

It is the purpose of the department to provide:

- a professional and approachable faculty who are dedicated to mentoring students.
- accessible, hands-on, practical laboratory experiences using relevant equipment and disciplined practices.

- opportunities for students to develop and practice oral and written communications skills.
- a broad-based curriculum that stresses fundamentals and the development of a professional work ethic.
- an environment that will produce students who are creative problem solvers while considering ethical and societal implications.

## COMPUTER SCIENCE

### Program Educational Objectives

Graduates of the Computer Science program will:

1. have a broad understanding of the world around them and the variety of people in it. They will be able to communicate effectively orally and in writing.
2. understand the abundance of languages and language types useful in the discipline and be able to design, build and use a wide variety of structures implemented in those languages.
3. understand the theory of computing and know the processes and algorithms appropriate for the discipline so they will be able to make judgements regarding the fitness of automated solutions to various problems and to use generally accepted techniques to produce those solutions.
4. be familiar with and be able to select and use the tools and devices available to build solutions to problems and have the skills to carry out the design and implementation of the same.
5. know the importance of creating solutions that clients want and that users can use.
6. be aware of the ethical issues involved in producing solutions to problems. In particular, they will be aware of the sensitive nature of processes and data that must be revealed to them during design, implementation and testing of problem solutions and they will be prepared to follow the ethical standards of the computing profession throughout their careers.

## COMPUTER ENGINEERING

### Program Educational Objectives

Graduates of the Computer Engineering program will:

1. be successful in their chosen career.
2. engage in career-long learning.
3. be effective communicators with those inside and outside of computer engineering.
4. understand the professional, ethical, and moral responsibilities of engineers.
5. understand the impact that their solutions have on society, both locally and globally.
6. be motivated to accept challenging assignments and responsibilities.
7. be productive members of society.
8. act as mentors and role models to junior engineers and students of engineering.

## Program Outcomes

Those students who are about to graduate with a degree in Computer Engineering will:

1. be able to apply their knowledge of math, science and engineering in combination with the use of appropriate techniques, skills and engineering tools to identify, formulate and solve computer engineering problems.
  2. be able to use engineering design methodology to produce a component, process or system either independently or in a team environment.
  3. have the ability to function in an engineering environment requiring communication between team members possessing separate skills and responsibilities yet working toward a common goal.
  4. be able to conduct engineering experiments, and analyze, interpret, and communicate the results in an effective manner in both written and oral form.
  5. recognize the need to continue learning in order to maintain an awareness of current technical challenges.
  6. understand the professional, ethical and moral responsibilities of engineers and the impact that their solutions have on society, both locally and globally.
3. be able to function in an engineering environment requiring communications between separate skills and responsibilities yet working toward a common goal.
  4. be able to conduct electrical engineering experiments, and analyze, interpret, and communicate the results in an effective manner in both written and oral form.
  5. be able to continue learning in order to maintain an awareness of current technical challenges in electrical engineering and therefore be able to accept increasing professional responsibility.
  6. understand the professional, ethical, and moral responsibilities of engineers and the impact that their solutions have on society, both locally and globally.

## ELECTRICAL ENGINEERING

### Program Educational Objectives

Graduates of the Electrical Engineering program will:

1. be successful in their chosen career.
2. engage in career-long learning.
3. be effective communicators with those inside and outside of electrical engineering.
4. understand the professional, ethical, and moral responsibilities of engineers.
5. understand the impact that their solutions have on society, both locally and globally.
6. be motivated to accept challenging assignments and responsibilities.
7. be productive members of society.
8. act as mentors and role models to junior engineers and students of engineering.

### Program Outcomes

Those students who are about to graduate with a degree in Electrical Engineering will:

1. be able to apply their knowledge of math, science, and engineering in combination with the use of appropriate techniques, skills, and engineering tools to identify, formulate, and solve electrical engineering problems.
2. be able to use engineering design methodology to produce an electrical

component, process, or system either independently or in a team environment.

3. be able to function in an engineering environment requiring communications between separate skills and responsibilities yet working toward a common goal.
4. be able to conduct electrical engineering experiments, and analyze, interpret, and communicate the results in an effective manner in both written and oral form.
5. be able to continue learning in order to maintain an awareness of current technical challenges in electrical engineering and therefore be able to accept increasing professional responsibility.
6. understand the professional, ethical, and moral responsibilities of engineers and the impact that their solutions have on society, both locally and globally.

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## Subject - Electrical & Computer Engineering and Computer Science (ECCS)

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### 133 - PROGRAMMING IN VISUAL BASIC

#### 4.00 Credits

Simple event-driven programming using the Visual Basic language. Simple data types, expressions, conditionals and iteration. Does not count toward Computer Science major. (Formerly CS 133) Offered Winter Quarter.

### 164 - PROGRAMMING 1 (4+0)

#### 4.00 Credits

Basic programming techniques, simple data types, expressions, functions, conditionals, iteration, and arrays. The use of a high-level programming language with a focus on simple algorithm development and writing programs that meet specification. Prerequisite: MATH 120 or its equivalent. (Formerly CS 164 and ECE 164) Offered Fall Quarter.

### 165 - PROGRAMMING 2 (4+0)

#### 4.00 Credits

Continuation of ECCS 164 including dynamic memory allocation and the object-oriented programming paradigm (classes, objects, methods, inheritance, polymorphism, and information hiding). Prerequisite: ECCS 164. (Formerly CS 165 and ECE 165) Offered Winter Quarter.

### 166 - PROGRAMMING 3 (4+0)

#### 4.00 Credits

Continuation of topics from ECCS 165 with the possible introduction of a second programming language. Usage of libraries, components, and the graphical user interface. Prerequisite: ECCS 165 (Formerly CS 166 or ECE 166) Offered Spring Quarter.

**182 - ECE CONCEPTS 1***1.00 Credit*

Construction, measurement, and testing of electronic circuits and systems. Laboratory practices. Advanced registration. Observation and evaluation of design process as applied to the current projects. Offered Winter Quarter.

**183 - ECE CONCEPTS 2***1.00 Credit*

Continuation of ECCS 182. Prerequisite: ECCS 182. Offered Spring Quarter.

**203 - SIGNALS AND SYSTEMS 1 (4+0)***4.00 Credits*

Linear time domain analysis techniques including impulse response and the superposition integral. Frequency domain analysis including Laplace transform and Fourier series. Prerequisite: MATH 275 and GE 202. (Formerly ECE 203) Offered Spring Quarter.

**228 - PROGRAMMING ENVIRONMENTS (4+0)***4.00 Credits*

Software development environments with integrated compiler, linker, debugger, editor, browser and project management. Development of an application with a graphical user interface (GUI). Additional study of object-oriented programming, inheritance and polymorphism. Prerequisite: ECCS 165; ECCS 166 is recommended. (Formerly CS 228) Offered Fall Quarter.

**231 - INTRODUCTION TO COBOL (4+0)***4.00 Credits*

Programming in COBOL with business applications. Offered alternate years. (Formerly CS 231)

**241 - WEB-ENABLED PROGRAMMING (4+0)***4.00 Credits*

The World Wide Web as a programming platform. Issues, tools and applications related to distributed computing will be covered. Offered alternate years. Prerequisite: ECCS 166. (Formerly CS 241)

**264 - ASSEMBLY LANGUAGE AND COMPUTER ORGANIZATION (4+0)***4.00 Credits*

Computer structure and machine language, assembly language programming, macros, program segmentation and linkage. Co-requisite: ECCS 166. (Formerly CS 264 and ECE 264) Offered Spring Quarter.

**268 - DATA STRUCTURES AND ALGORITHMS (4+0)***4.00 Credits*

Emphasis on data abstraction as a primary tool in software construction. Use of modern programming language abstraction features to implement classical data structures: linear structures (lists, stacks, queues), tree structures (BTrees, AVL Trees, Splay Trees), hash tables and graphs. Introduction to space and time complexity analysis. Prerequisites: MATH 336 and ECCS 166. (Formerly CS 268 and ECE 268) Offered Winter Quarter.

**292 - EXTERNAL RESEARCH EXPERIENCE***1.00 to 4.00 Credits*

A planned learning experience involving participation in an approved off-campus research program. A paper and an oral presentation regarding the research experience are required. Department approval required prior to research experience. Graded S/U. Prerequisite: Permission of instructor.

**301 - SIGNALS AND SYSTEMS 2 (4+0)***4.00 Credits*

Continuous frequency domain analysis using the Fourier transform. Analysis of multiple input/output systems using state variables. Discrete time analysis using the Z-Transform. Prerequisite: ECCS 203. (Formerly ECE 301) Offered Fall Quarter.

**321 - ANALOG ELECTRONICS 1 (3+3)***4.00 Credits*

Analysis and design of analog electronic circuits using semiconductor diodes, transistors and integrated circuits. Computer techniques will be combined with laboratory work for several projects during the quarter. Prerequisite: ECCS 203. (Formerly ECE 321) Offered Fall Quarter.

**322 - ANALOG ELECTRONICS 2 (3+3)***4.00 Credits*

Continuation of ECCS 321. Prerequisite: ECCS 321. (Formerly ECE 322) Offered Winter Quarter.

**323 - FILTER DESIGN (3+2)***4.00 Credits*

Analysis and design of electronic filters including Butterworth and Chebyshev lowpass, highpass, bandpass and bandstop examples. Filters will be designed using several computer applications and evaluated via computer and laboratory measurements. Prerequisite: ECCS 301. (Formerly ECE 323) Offered Spring Quarter.

### **330 - ORGANIZATION OF PROGRAMMING LANGUAGES (4+0)**

#### *4.00 Credits*

Theoretical investigation of programming language constructs; illustration of construct implementation in popular programming languages. Prerequisite: ECCS 264. (Formerly CS 330) Offered Fall Quarter.

### **331 - ELECTROMAGNETICS (5+0)**

#### *5.00 Credits*

An axiomatic approach to static electric fields, static magnetic fields, and time varying fields leading to Maxwell's equations. Fundamentals of analysis in electromagnetism with engineering application to transmission lines. Prerequisites: MATH 263 and PHYS 233. (Formerly ECE 331) Offered Fall Quarter.

### **332 - OPERATIONS RESEARCH (4+0)**

#### *4.00 Credits*

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

### **335 - ENERGY CONVERSION (3+3)**

#### *4.00 Credits*

Analysis and design of electrical energy conversion systems emphasizing electromechanical devices, system representation, system analysis and system design. Prerequisites: GE 202 and ECCS 331. (Formerly ECE 332) Offered Winter Quarter.

### **336 - POWER SYSTEMS (3+3)**

#### *4.00 Credits*

Single line diagrams and per unit calculations, modeling of transmission lines. Load flow techniques, economic dispatch, fault studies. Prerequisite: ECCS 335. (Formerly ECE 333) Offered Spring Quarter.

### **341 - ARTIFICIAL INTELLIGENCE (4+0)**

#### *4.00 Credits*

Artificial intelligence problems, and techniques for their solution. Includes use of LISP, search algorithms, knowledge representation, expert systems, parsing language and language comprehension, learning. Prerequisite: Knowledge equivalent of two (2) quarters of a programming language (ECCS 164 and ECCS 165) or consent of the instructor. Offered alternate years. (Formerly CS 341)

### **348 - DATABASES (4+0)**

#### *4.00 Credits*

Overview, models and applications of database systems, including the relational data model. Prerequisite: ECCS 164 or ECCS 231. Offered alternate years. (Formerly CS 348)

### **360 - DIGITAL LOGIC (3+3)**

#### *4.00 Credits*

Specification, analysis and implementation of combinational circuits. Two-level and multi-level gate networks. Specification, analysis and design of sequential systems. Standard logic modules and programmable logic arrays. Application of VHDL and Xilinx software design tools. Verification of digital systems in FPGAs or CPLDs. Prerequisite: MATH 336. Offered Fall Quarter.

### **361 - DIGITAL ELECTRONICS (4+3)**

#### *5.00 Credits*

Combinational logic and synchronous sequential system analysis and design. Definition and characterization of logic gates at the transistor level; Karnaugh maps; Moore and Mealy structures; state diagrams and state tables, application of software design tools. Characterization and synthesis with PLD and FPGA devices. Design projects. Integrated laboratory experimental activities. Prerequisites: MATH 336 and GE 201. (Formerly ECE 361) Offered Fall Quarter.

### **362 - MICROPROCESSORS (3+3)**

#### *4.00 Credits*

Microprocessors and embedded microprocessor system design. Microprocessor structure, registers, RAM and ROM addressing. Machine cycles and timing relationships. Input and output ports and addressing. Assembly level programming. Microcontroller structure, instruction set and programming. Use of development systems and design simulators. Embedded microcontroller design projects. Integrated laboratory experimental activities. Prerequisite: ECCS 361. (Formerly ECE 362) Offered Winter Quarter.

### **363 - ADVANCED DIGITAL ELECTRONICS (3+3)**

#### *4.00 Credits*

VLSI Fabrication Process, MOS transistor and SPICE modeling, MOS inverters; static and dynamic characteristics, interconnect effects, CMOS static logic families, CMOS dynamic logic circuits, semiconductor memories and implementations, I/O Circuits, System Design Topics on Design for Manufacturability and Testability; Use of industry-standard computer-aided design tools to simulate, design and verify CMOS integrated circuits. Prerequisites: ECCS 361 and ECCS 365 is recommended. (Formerly ECE 363) Offered Spring Quarter.

**365 - COMPUTER ARCHITECTURE (4+0)***4.00 Credits*

Aspects of computer hardware; computer arithmetic, microarchitecture design (both datapath and control unit), instruction sets, storage hierarchies. Introduction to system organization. Current families of microprocessors illustrating design tradeoffs. Prerequisites: ECCS 264 and ECCS 360 or 361. (Formerly CS 365 and ECE 365) Offered Winter Quarter.

**366 - NETWORKS AND DATA COMMUNICATION (4+0)***4.00 Credits*

Networking using the internet protocol stack-application, transport, network, link and physical layers. Detailed study of many of the widely used protocols (IP, TCP, UDP, HTTP, etc.) and of widely deployed devices (hubs, bridges, switches, routers, etc.). Issues of ethical behavior of network users. Prerequisite: ECCS 268. (Formerly CS 346, CS 366 and ECE 366) Offered Winter Quarter.

**380 - SPECIAL TOPICS***1.00 to 4.00 Credits*

Selected topics in electrical or computer engineering or computer science of current interest. Prerequisite: Permission of instructor. (Formerly ECE 380)

**390 - INDEPENDENT STUDY***1.00 to 4.00 Credits*

Individual study of topic in electrical or computer engineering or computer science of particular interest to the ECCS student. Prerequisite: Permission of instructor. (Formerly ECE 390)

**392 - EXTERNAL RESEARCH EXPERIENCE***1.00 to 4.00 Credits*

A planned learning experience involving participation in an approved off-campus research program. A paper and an oral presentation regarding the research experience are required. Department approval required prior to research experience. Prerequisite: Permission of instructor. Graded S/U.

**404 - SENIOR DESIGN SEMINAR (1+0)***1.00 Credit*

Characteristics of engineering design projects. Topics include research, project planning, reliability, safety, economics, design methodology, and liability. Formal project proposals and plans are written. Prerequisite: Senior standing. (Formerly ECE 404) Offered Fall Quarter.

**405 - SENIOR DESIGN (4+0)***4.00 Credits*

A comprehensive project relevant to electrical or computer engineering or to computer science. Application of the engineering design principles studied in ECCS 404. Students are expected to spend a minimum of 12 hours per week directed exclusively to project activities. Prerequisite: ECCS 404. (Formerly ECE 405) Offered Winter Quarter.

**406 - ENGINEERING TECHNICAL COMMUNICATION (3+0)***3.00 Credits*

The presentation of technical information in both written and oral formats. Students will use projects of ECCS 405 as sources of material for presentations. Prerequisite: ECCS 405. (Formerly ECE 406) Offered Spring Quarter.

**411 - DIGITAL SIGNAL PROCESSING (3+2)***4.00 Credits*

Analysis and design of discrete systems including FIR and IIR digital filters. Discrete time systems will be evaluated using several computer applications as well as dedicated hardware systems. Prerequisite: ECCS 323. (Formerly ECE 411) Offered Fall Quarter.

**416 - ADVANCED TOPICS IN DSP (2+2)***3.00 Credits*

Application of digital signal processing to speech and image data using a variety of computer tools and hardware systems. Projects requiring the design of processing systems for speech and/or image data will be required. Prerequisite: ECCS 411. (Formerly ECE 416)

**433 - ADVANCED TOPICS IN ENERGY CONVERSION (3+0)***3.00 Credits*

Selected advanced topics in energy conversion. Prerequisite: ECCS 335. (Formerly ECE 433)

**444 - CONTROL SYSTEMS 1 (3+3)***4.00 Credits*

Classical feedback control systems. Mathematical modeling of systems. Second-order system performance. Routh stability criteria. Steady-state error analysis. Computer simulation. Integrated laboratory experience. Prerequisites: ECCS 301 and ECCS 335. (Formerly ECE 444) Offered Fall Quarter.

**445 - CONTROL SYSTEMS 2 (3+3)***4.00 Credits*

Design of feedback control systems. Root-locus. Frequency response. Stability in frequency domain. Cascade compensation (lag, lead, PID). Computer simulation. Integrated laboratory experience. Prerequisite: ECCS 444. (Formerly ECE 445) Offered Winter Quarter.



**446 - ADVANCED TOPICS IN CONTROL SYSTEMS (3+0)**

3.00 Credits

Selected advanced topics in control systems.

Prerequisite: ECCS 445. (Formerly ECE 446)

**448 - FOUNDATIONS OF COMPUTING (4+0)**

4.00 Credits

Analysis of algorithms. Computability and complexity theory. The halting problem; P and NP classes of algorithms; NP-completeness.

Prerequisite: MATH 336. (Formerly CS 448)

Offered Fall Quarter.

**458 - COMMUNICATION SYSTEMS 1 (3+3)**

4.00 Credits

Analysis and design of Analog Communication Circuits. Prerequisites: ECCS 301 and ECCS 322. (Formerly ECE 458)

Offered Winter Quarter.

**459 - COMMUNICATION SYSTEMS 2 (3+3)**

4.00 Credits

Performance measures for analog systems with noise. Analysis and design of Digital Communications Systems using statistical methods. Prerequisite: ECCS 458. (Formerly ECE 459) Offered Spring Quarter.

**461 - NUMERICAL ANALYSIS 1 (4+0)**

4.00 Credits

Matlab is used as a programming language to numerically solve problems in algebra and calculus involving linear and nonlinear equations. Real and complex roots, interpolation, fixed point recursion, accuracy and precision. Matrix inversion, ill-conditioned systems of linear equations and eigenvalues. Chebyshev polynomials and economized power series. Offered alternate years. Prerequisites: MATH 165 and MATH 272. (Formerly CS 461) (Also listed as MATH 461)

**462 - NUMERICAL ANALYSIS 2 (3+0)**

3.00 Credits

Matlab is used as a programming language to numerically solve programs in calculus and differential equations. Finite and divided differences, curve fitting, orthogonal polynomials, numerical differentiation and integration, numerical solutions of ordinary differential equations by series, Runge-Kutta and predictor-corrector methods. Numerical Analysis 1 (ECCS 461) is not a prerequisite. Offered alternate years. Prerequisites: MATH 272 and MATH 275. (Formerly CS 462) (Also listed as MATH 462)

**464 - SOFTWARE ENGINEERING (4+0)**

4.00 Credits

The methodologies used to design, create, evaluate, and maintain software systems, including coverage of several modern methodologies with emphasis on one. A project written in a modern software development environment will be developed. Prerequisites: ECCS 228 or ECCS 268. (Formerly CS 464 and ECE 464) Offered Spring Quarter.

**466 - OPERATING SYSTEMS (4+0)**

4.00 Credits

Operating system principles; multi-programming, virtual memory, client-server models for operating systems. Prerequisite: ECCS 268. (Formerly CS 466 and ECE 466) Offered Spring Quarter.

**467 - COMPUTER DEVICE LABORATORY (3+3)**

4.00 Credits

Synchronous and asynchronous bus design. Motherboard implementation issues, clock skew, power dissipation. Device interfacing and device operation. Prerequisite: ECCS 365. (Formerly ECE 467) Offered Spring Quarter.

**468 - COMPILERS (4+0)**

4.00 Credits

Scanning; parsing; type checking for strongly typed languages; symbol table generation and maintenance; code generation for simple instruction sets. Prerequisite: ECCS 268. (Formerly CS 468 and ECE 468) Offered Fall Quarter.

**472 - ENGINEERING ECONOMY (4+0)**

4.00 Credits

Decision making based on criteria of economic factors including present worth, final worth, internal rate of return, cost benefit ratio, depreciation, taxes and others. Prerequisite: ECCS senior standing. (Formerly ECE 472) Offered Winter Quarter.

**480 - SPECIAL TOPICS**

1.00 to 4.00 Credits

Selected topics in electrical or computer engineering or computer science of current interest. Prerequisite: Permission of instructor. (Formerly ECE 480)

**490 - INDEPENDENT STUDY**

1.00 to 4.00 Credits

Individual study of topic in electrical or computer engineering or computer science, of particular interest to the ECCS student. Prerequisite: Permission of instructor. (Formerly ECE 490)

## 492 - EXTERNAL RESEARCH EXPERIENCE

1.00 to 4.00 Credits

A planned learning experience involving participation in an approved off-campus research program. A paper and an oral presentation regarding the research experience are required. Department approval required prior to research experience. Prerequisite: Permission of instructor. Graded S/U.

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## DEPARTMENT OF MECHANICAL ENGINEERING

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Professor Rider; Associate Professor Marquart; Visiting Associate Professor Winowich; Assistant Professors Laird (*Interim Chair*), Yoder; Visiting Assistant Professor Mitra

### Vision Statement

To be a premier undergraduate mechanical engineering department preparing graduates for post-graduate studies and successful life-long careers in the service of society.

### Mission Statement

The mission of the mechanical engineering department shall be the continuous pursuit of excellence by providing a quality mechanical engineering education founded in science and mathematics. Graduates shall have the abilities to work logically, accurately, and efficiently, and to continue to enhance their careers through life-long learning. They will be inspired with a desire to contribute positively to humanity and the environment. Students will be provided with the best teaching methods, facilities, and state-of-the-art technologies available.

### Program Education Objectives

Upon graduation, Mechanical Engineering students will:

1. understand the principles of mechanical engineering.
2. be able to communicate effectively to a variety of audiences.
3. understand the role and impact of mechanical engineering in society.

### Program Outcomes

Each Mechanical Engineering graduate will:

1. be able to apply their knowledge of mathematics, science, and engineering fundamentals to solve engineering problems.

2. be able to use a variety of tools (e.g. software packages, analysis tools, manufacturing tools) found in the professional workplace.
3. have a broad understanding of mechanical design principles, thermal and fluid principles, and manufacturing principles.
4. be able to apply the mechanical design process and understand its role in the product realization process.
5. be prepared for professional practice, further studies, and graduate school.
6. have completed at least one detailed, in-depth team design project.
7. be able to design, set up, and conduct experiments, then analyze and draw conclusions from the resultant experimental data.
8. demonstrate effective professional communication skills including technical writing, oral presentation, technical drawing, and listening skills.
9. have participated as an active member of an engineering design team. When applicable, the team may include various disciplinary backgrounds.
10. be prepared for career-long learning.
11. be prepared to work ethically, professionally, and responsibly.
12. have a knowledge of contemporary issues and an understanding of how mechanical engineering relates to society.
13. have gained knowledge of engineering research/industrial practices.
14. understand and accept that their actions and decisions are to be directed outward for the good of society, rather than inward to their own benefit.

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## Subject - Mechanical Engineering (ME)

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### 202 - COMPUTER APPLICATIONS AND DESIGN (3+2)

4.00 Credits

The techniques involved in designing, implementing and testing computer programs and data acquisition systems. An introduction to the instruments and software used in data acquisition will be included. Prerequisite: GE 102. Offered Spring Quarter.

### 311 - PROCESS OF MECHANICAL DESIGN (4+0)

4.00 Credits

The process of design is covered, focusing on problem-solving methodology and project management. Teamwork tools are taught and used on a team design project. Formal design tools such as QFD, DOE, and FMEA are covered. Prerequisite: GE 223. Offered Fall Quarter.

### **319 - ADVANCED STRENGTH OF MATERIALS (4+0)**

*4.00 Credits*

Mechanics of materials such as linear elastic fracture mechanics, behavior of plastic materials, and initially-curved beams.

Prerequisite: GE 223. Offered Spring Quarter.

### **341 - MANUFACTURING PROCESSES (3+2)**

*4.00 Credits*

Manufacturing engineering and technology including casting, rolling, forging, extrusion, drawing, sheet forming, power metallurgy, machining, welding, SPC, etc. The basic theories of casting, forming processing and machining. Laboratory work includes operating basic process machines (mill, drill, lathe, welding, etc.) and SPC. Manufacturing plant tours are included.

Prerequisite: GE 243. Offered Fall Quarter.

### **352 - MECHANISMS (4+3)**

*5.00 Credits*

Kinematics and kinetics of mechanisms, analysis and synthesis of linkages, cams and gears. Prerequisites: MATH 272 and GE 214. Offered Winter Quarter.

### **362 - THERMODYNAMICS (4+0)**

*4.00 Credits*

Fundamentals of classical thermodynamics. Heat transfer, work and properties of pure substances. The First and Second Laws of Thermodynamics. Irreversibility factors of energy and work. Analysis and design of refrigeration cycles, heat pump cycles and various power cycles. Prerequisites: CHEM 163 and PHYS 232. Offered Winter Quarter.

### **363 - THERMODYNAMICS OF FLUIDS (4+2)**

*5.00 Credits*

Applications of the fundamentals of thermodynamics and the development of fluid mechanics principles. Investigation of heat pump, refrigeration and various power systems. The principles of static fluids will be developed, including buoyancy and incompressible, inviscid flow. Nonreacting and reacting gas mixtures and combustion will be addressed.

Prerequisite: ME 362. Offered Spring Quarter.

### **371 - NUMERICAL METHODS (4+0)**

*4.00 Credits*

Numerical methods applicable to problems arising in engineering practice; exact and approximate solutions investigated; finite methods used for linear and nonlinear equation solution; ordinary and partial differential equations treated. Prerequisites: MATH 275 and 361; ME 202. Offered Fall Quarter.

### **380 - SPECIAL TOPICS**

*1.00 to 5.00 Credits*

Selected topics of current interest in mechanical engineering. Prerequisite: Permission of instructor.

### **382 - ENGINEERING ANALYSIS (4+0)**

*4.00 Credits*

Solution of open-ended engineering problems (engineering design) using professional method. Emphasis placed on learning to deal with new situations in terms of fundamental mathematics, science, and engineering principles.

Prerequisites: MATH 275 and GE 214. Offered Winter Quarter.

### **383 - FINITE ELEMENT ANALYSIS (3+2)**

*4.00 Credits*

The finite element method techniques are studied. These techniques are used to solve engineering continuum problems, both "by hand" and using the general purpose FEA package, ANSYS, on the workstations. Applications to engineering design of static and dynamic structures, as well as thermal systems. Prerequisites: GE 223 and ME 371. Offered Spring Quarter.

### **390 - INDEPENDENT STUDY**

*1.00 to 5.00 Credits*

Individual study of topic of particular interest to the student in mechanical engineering.

Prerequisite: Permission of instructor.

### **411 - CAPSTONE 1 (0+3)**

*1.00 Credit*

Initiation of capstone design project as a team effort. Prerequisite: ME 311. Offered Fall Quarter.

### **412 - CAPSTONE 2 (0+3)**

*1.00 Credit*

Continuation of capstone design project as a team effort. Prerequisite: ME 411. Offered Winter Quarter.

### **413 - CAPSTONE 3 (0+6)**

*2.00 Credits*

Completion of capstone design project as a team effort. Prerequisite: ME 412. Offered Spring Quarter.

### **417 - MECHANICAL DESIGN OF COMPONENTS (4+0)**

*4.00 Credits*

Design and selection of various machine elements. Design teams work on projects. Prerequisite: ME 319. Offered Fall Quarter.

#### **418 - VIBRATION ANALYSIS**

*4.00 Credits*

Fundamentals of linear vibration includes damped and undamped systems single and multi-degree of freedom systems, and free or forced vibration. Prerequisites: MATH 275, GE 214 and ME 202. Offered Spring Quarter.

#### **419 - CONTROL SYSTEMS (4+2)**

*5.00 Credits*

Modeling, analysis and design of linear feedback control systems. Laplace transforms, transfer functions and frequency response. Introduction to digital controls and logic. Laboratory work in digital logic design, and performance studies of real systems. Prerequisite: Math 275, GE 214 and ME 202. Offered Winter Quarter.

#### **429 - APPLICATIONS IN CONTROL SYSTEMS (3+2)**

*4.00 Credits*

Applications in control systems concentrating on PLCs and ladder logic. Advanced control theory explored. Laboratory work concentrates on PLC applications. Prerequisite: ME 419.

#### **442 - MANUFACTURING SYSTEMS (3+2)**

*4.00 Credits*

The problems associated with manufacturing and solutions to some of these problems. Includes planning for system change and the application of computer integrated manufacturing. Prerequisite: ME 341.

#### **462 - COMPUTATIONAL FLUID DYNAMICS (3+2)**

*4.00 Credits*

The theory and methods of computational fluid dynamics, including grid generation, flow solution and postprocessing analysis. Implicit and explicit methods are studied, as well as direct and iterative solution techniques, and stability criteria. Students develop their own computer programs, as well as working with established computer codes. Prerequisites: ME 371 and 464.

#### **464 - FLUID MECHANICS (4+2)**

*5.00 Credits*

Fundamentals of incompressible and compressible, viscous and inviscid flows. Application to external and internal flow configurations in the fields of fluid mechanics and aerodynamics. Analysis and design of piping systems, pump design and selection. Concurrent laboratory experience with flow and property measurement, pumps and piping systems. Prerequisites: MATH 275 and ME 363. Offered Fall Quarter.

#### **467 - HEAT TRANSFER 1 (4+0)**

*4.00 Credits*

Heat conduction in steady and unsteady states in one and two dimensions. Thermal radiation concepts. Graphical, numerical and electrical analog methods of solutions. Heating and cooling of buildings. Prerequisites: MATH 275 and PHYS 232. Offered Fall Quarter.

#### **468 - HEAT TRANSFER 2 (4+2)**

*5.00 Credits*

Fundamentals of free and forced convection. Analytical and empirical convection correlations for internal and external theory to design. Condensation and boiling theories and their effects on heat transfer. Heat exchanger design and analysis. Application of theory to design. Laboratory reinforced study of conduction, convection, radiation and design. Prerequisite: ME 467. Offered Winter Quarter.

#### **480 - SPECIAL TOPICS**

*1.00 to 5.00 Credits*

Selected topics of current interest in mechanical engineering. Prerequisite: Permission of instructor.

#### **490 - INDEPENDENT STUDY**

*1.00 to 5.00 Credits*

Individual study of a topic of a particular interest to a student in mechanical engineering. Prerequisite: Permission of instructor.



# THE RUDOLPH H. RAABE COLLEGE OF Pharmacy

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## **Bobby G. Bryant,** *Dean*

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The Raabe College of Pharmacy at Ohio Northern University endeavors today to meet the high standards of education demanded by the health professions. The college occupies a modern building designed and equipped to provide the facilities required for programs in the health sciences.

Throughout its more than 118-year history, the Ohio Northern University College of Pharmacy has played an important role in pharmaceutical education. Its position in Ohio is particularly significant. Over 7100 pharmacists have been graduated by this institution and its graduates are particularly active in local, state, and national health-related organizations.

**The Pharmacy Alumni Endowed Chair** was established in 1984 through the generosity of pharmacy alumni and friends in celebration of the centennial of the College.

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## **Accreditation and Affiliations**

The Raabe College of Pharmacy's Baccalaureate in Pharmacy and Doctor of Pharmacy programs are accredited by the American Council on Pharmaceutical Education (ACPE). Both pharmacy degrees are recognized by the Board of Pharmacy of the State of Ohio as meeting the educational requirement for licensure examination. The College of Pharmacy is a member of the American Association of Colleges of Pharmacy, and the Council of Ohio Colleges of Pharmacy.

### **Departments**

Department of Pharmacy Practice (PHPR)  
Department of Pharmaceutical and Biomedical Sciences (PHBS)

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## **Mission Statement**

The mission of the College of Pharmacy is to prepare students to enter the practice of pharmacy so they may contribute effectively to their profession. The College is responsible for generating and disseminating new knowledge about drugs and pharmaceutical care systems.

Context of statement: The College is responsible for educating well-rounded individuals with

the ability to adapt to the changing profession. The educational process includes the scientific fundamentals necessary to adapt to future careers in the changing profession, the values necessary to serve society, the development of problem-solving and communication skills, and practice experience.

The faculty accept their role in teaching, conducting basic and applied research and providing service to the profession.

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## **Admission Standards**

Persons seeking admission to the College must provide the necessary information and meet the general requirements for admission to the University as listed in that section of this catalog. Students who qualify under those standards are reviewed for final approval for admission by the dean of the college or his designate.

**High School Graduates.** It is recommended that high school graduates should have completed the college preparatory course including four units of English, four units of mathematics (algebra I and II, plane geometry, trigonometry or precalculus, or calculus) and four units of science (biology, chemistry, and physics) and six units of history, social studies, languages or any combination thereof. Priority may be granted to students with additional credits. Students found to be deficient in these areas may be required to pursue additional work prior to being scheduled in the regular course of study.

**Transfer Students.** A student desiring to transfer from another accredited college or university must present authenticated academic transcripts from all institutions attended. Credit will be allowed for any course in which a grade of C or better was received provided such work is parallel to the requirements for graduation from this institution (grades of C- are not transferable).

Grades of P (passing) or S (satisfactory) are accepted when the academic institution certifies their equivalence to a C or better. Approval for admission and advanced placement will be determined upon review of the student's previous record. Students entitled to advanced standing may enter at the time approved by the dean of the College of Pharmacy.

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## Doctor of Pharmacy Degree Requirements

The Doctor of Pharmacy degree is an advanced professional program that provides a foundation in the basic sciences of pharmacy as well as a comprehensive understanding of health care settings. Specifically, the graduate will have training in clinical skills which will allow entry into advanced practice settings. The program of study leading to the degree of Doctor of Pharmacy is a combination of general education courses, basic sciences, professional pharmacy courses and electives.

This program requires a minimum of 324 quarter hours of study divided according to the following:

General education courses	48 hours
Basic science courses	70 hours
Professional courses	184 hours
Electives	22 hours

**General Education Requirements.** The liberal studies component of the pharmacy degree curriculum consists of 48 quarter hours and intends to contribute significantly to the student's becoming an educated professional and a responsible citizen. These foundation courses provide the background for advanced education and are listed under the common discipline areas of communication competence, culture and society, aesthetic sensibility, and human values.

### *Communication Competence*

Writing 110

Writing 111

Public Speaking 211 or

Interpersonal Communication 225

### *Culture and Society*

Great Works of Literature 204

Western Civilization 110 or 111

Psychology 100

Sociology 105

Economics 100

One course in non-Western culture

### *Aesthetic Sensibility*

Art 100 or Music 100 or Theatre 105

### *Human Values*

Religions East and West 107 or Religion 105 or Religious Experience 231\*

Ethics 238 or Ethics in Professional Life 336

\*RELG 231 can be utilized to satisfy either the non-Western culture requirement or the religion requirement but will NOT satisfy both.

An approved Honors Seminar may fulfill a requirement listed above. For specific information, see the office of the dean.

**Basic Science Requirements.** Basic sciences are needed in the pharmacy curriculum to provide not only the background required for professional pharmacy courses but also to contribute to developing a scientific literacy necessary to function in an increasingly complex and technical world.

Introductory Chemistry 171, 172, 173

Organic Chemistry 251, 252, 253

General Biology 121

Introduction to Zoology 122

Introduction to Human Anatomy and Histology 124

Physiology 331, 332, 333

Biosciences Laboratory 322, 323

Medical Microbiology 313

Calculus for Life Sciences 1 154

Biostatistics 1 156

Biostatistics 2 256

Physics 120

### **Professional Pharmacy Requirements.**

Courses offered by the departments of Pharmaceutical and Biomedical Sciences and Pharmacy Practice as well as the collaborative efforts demonstrated in the area of Biomedical Science and Patient Care, are designed to meet the intellectual standards that are expected of the modern pharmacist, including the high ethical behavior American society envisions of its pharmacists.

### *Pharmaceutical and Biomedical Sciences*

Biochemistry 1, 2 341, 342

Immunology 375

Pharmaceutical Sciences Modules 1, 2 431, 432

Biomedical Sciences Modules 1, 2 443, 444

### *Pharmacy Practice*

The Profession of Pharmacy 1, 2, 3 101, 102, 103

The Profession of Pharmacy 4, 5, 6 201, 202, 203

The Profession of Pharmacy 7, 8, 9 301, 302, 303

Introduction to OTC Products 331

Patient Care Assessment Modules 1,2 401, 402

Pharmaceutical Administration Module 550

Advanced Practical Rotations 650 (Pharm. D.)

### *Biomedical Science and Patient Care*

Cardiovascular System Module 441

Infectious Disease Module 442

Central Nervous System Module 543

Endocrine System Module 544

Oncology Module 545

Capstone 546 (Pharm.D.)

### *Electives*

Elective course hours for the pharmacy program may be selected from courses in Arts and Sciences, Business Administration, and the College of Pharmacy. Students may plan elective courses for personal enrichment or to satisfy a minor or a second major.

## Doctor of Pharmacy Degree Curriculum

### First Year

Introductory Chemistry 1, 2, 3 171, 172, 173	15 hours
General Biology 121	4 hours
Introduction to Zoology 122	4 hours
Introduction to Human Anatomy and Histology 124	4 hours
Calculus for Life Sciences 1 154	4 hours
The Profession of Pharmacy 1, 2, 3 101, 102, 103	3 hours
General Education/Electives	20 hours
<b>TOTAL</b>	<b>54 hours</b>

### Second Year

The Profession of Pharmacy 4, 5, 6 201, 202, 203	6 hours
Organic Chemistry 1, 2, 3 251, 252, 253	12 hours
Physics 120	4 hours
Biostatistics 1 156	4 hours
Biostatistics 2 256	4 hours
General Education/Electives	24 hours
<b>TOTAL</b>	<b>54 hours</b>

### Third Year

The Profession of Pharmacy 7, 8, 9 301, 302, 303	6 hours
Biochemistry 1, 2 341, 342	8 hours
Medical Microbiology 313	4 hours
Introduction to OTC Products 331	4 hours
Immunology 375	4 hours
Physiology 1, 2, 3 331, 332, 333	9 hours
Biosciences Laboratory 1, 2 322, 323	2 hours
General Education/Electives	17 hours
<b>TOTAL</b>	<b>54 hours</b>

### Fourth Year

Pharmaceutical Sciences Modules 1, 2 431, 432	16 hours
Biomedical Sciences Modules 1, 2 443, 444	16 hours
Patient Care Assessment Modules 1, 2 401, 402	4 hours
Cardiovascular System Module 441	9 hours
Infectious Disease Module 442	9 hours
<b>TOTAL</b>	<b>54 hours</b>

### Fifth Year

Central Nervous System Module 543	9 hours
Endocrine System Module 544	9 hours
Oncology Module 545	9 hours
Pharmaceutical Admin. Module 550	9 hours
Capstone 546	9 hours
Electives	9 hours
<b>TOTAL</b>	<b>54 hours</b>

### Sixth Year

Advanced Practice Rotations 650	54 hours
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## Bachelor of Science in Pharmacy Degree Requirements

The Bachelor of Science in Pharmacy degree is a five-year curriculum that provides a foundation in the basic sciences of pharmacy as well as a comprehensive understanding of the practice of pharmacy.

The program of study leading to the degree of Bachelor of Science in Pharmacy requires a minimum of 256 quarter hours of study, and is a combination of general education courses, basic sciences and professional pharmacy courses. The 256 quarter hours are divided according to the following:\*

General education course	48 quarter hours
Basic science courses	70 quarter hours
Professional courses	138 quarter hours

\*for students who entered Fall 1998 and Fall 1999.

### Fifth Year

Central Nervous System Module 543	9 hours
Endocrine System Module 544	9 hours
Oncology Module 545	9 hours
Pharmaceutical Admin. Module 550	9 hours
Bach. of Sci./Pharmacy Experiential Module 570	18 hours
<b>TOTAL</b>	<b>54 hours</b>

## Doctor of Pharmacy (Non-Traditional) Admission Requirements

Applicants seeking admission to the non-traditional Doctor of Pharmacy program must meet the following criteria:

1. Hold a baccalaureate degree in pharmacy.
2. Have a minimum of two years of practical experience as a pharmacist.
3. Hold a current, valid pharmacist license.
4. Have no disciplinary actions taken against the pharmacist's license.

Each applicant must submit an application form accompanied by a photocopy of a current valid pharmacist license, three letters of recommendation, and current resumé. Non-ONU graduates or those having completed academic work at another institution must also include an official transcript issued directly to the registrar's office.



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## Doctor of Pharmacy (Non-Traditional) Degree Requirements

The non-traditional Doctor of Pharmacy degree has been developed to meet the needs of pharmacists who are unable to return to campus as fulltime students. The program of study is comprised of 39 quarter hours of didactic course work and 30 hours of advanced practice rotations (6) for a total of 69 hours. A pharmacist, enrolled in the program, will have a maximum of three years to complete the didactic courses and a maximum of five years to complete the program.

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## Non-Traditional Doctor of Pharmacy Degree Curriculum

Orientation to Doctor of Pharmacy 701	0 hours
Biostatistics 710	3 hours
Drug Literature Evaluation 720	3 hours
Pharmacokinetics 730	3 hours
Physical Assessment 740	3 hours
Pathophysiology and Therapeutics	
Cardiology 750	3 hours
Renal 755	3 hours
Infectious Disease 760	3 hours
Central Nervous System/ Psychiatric 765	3 hours
Respiratory 770	3 hours
Endocrine 775	3 hours
GI Tract/Nutrition 780	3 hours
Oncology 785	3 hours
Dermatology/Ophthalmic 790	3 hours
Advanced Practice Rotations 800	30 hours
TOTAL	69 hours

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## Requirements for Graduation

*Each candidate for a Bachelor of Science in Pharmacy degree must:*

1. be of good moral character.
2. have completed the required curriculum of 256 (255 if entered prior to Fall 1998) quarter hours.
3. have earned a cumulative grade point average of 2.00 in all course work.
4. have successfully completed (based on the General Administrative and Academic Regulations) the B.S. Pharm. curriculum as outlined on page 213.
5. satisfy a minimum residency requirement as established by the dean of the college.
6. be recommended for the degree by a majority vote of the faculty of the university.

7. meet such other qualifications as the faculty of the college may determine.

*Each candidate for a Doctor of Pharmacy degree must:*

1. be of good moral character.
2. have completed the required curriculum of 324 credit hours.
3. have earned a cumulative grade point average of at least 2.00 in all course work.
4. have successfully completed (based on the General Administrative and Academic Regulations) the Pharm. D. curriculum as outlined on page 213.
5. satisfy a minimum residency requirement as established by the dean of the college.
6. be recommended for the degree by a majority vote of the faculty of the university.
7. meet other such qualifications as the faculty of the college may determine.

*Each candidate for a Doctor of Pharmacy (non-traditional) degree must:*

1. be of good moral character.
2. have completed the required curriculum of 69 quarter hours.
3. have earned a cumulative grade point average of 2.00 in all required courses. Previous cumulative grade point average from prior degree will not be included.
4. be recommended for the degree by a majority vote of the faculty of the university.

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## Doctor of Pharmacy (Non-traditional) Degree for ONU Bachelor of Pharmacy Graduates (May 2000-2005)

This non-traditional Doctor of Pharmacy degree has been developed to meet the needs of ONU Bachelor of Pharmacy graduates, between May 2000 and May 2005, who return to complete the entry level Pharm.D. degree requirements. The program of study is comprised of up to an additional 15 didactic hours, on campus, and 54 hours of advanced practice rotations (9) for a combined total of 324 quarter hours. A licensed pharmacist, enrolled in the program, will have a maximum of five (5) years to complete the program.

A pharmacist accepted into the program:

1. must have completed the modular didactic curriculum and graduated from Ohio Northern University with a Bachelor of Science in Pharmacy between May 2000 and May 2005.
2. must successfully complete (grade of "C" or better) the on campus Spring quarter Capstone

546 module (9 hours) and electives (up to 6 hours) to equal a total of 270 quarter hours.

3. must successfully complete the prescribed full-time advanced practice (PHPR 650) rotations over a time period not to exceed five (5) years from the starting date.
4. may challenge out of a maximum of two advanced practice rotations by following the University/College guidelines for course challenge.
5. meet the criteria for graduation as outlined below:
  - a. be of good moral character;
  - b. have completed the required curriculum as described in 2 and 3 above.
  - c. have earned a cumulative grade point average of 2.00 in all courses. Previous grade point average is not included.
  - d. be recommended for the degree by a majority vote of the faculty of the university.

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## General Administrative and Academic Regulations

General administrative and academic regulations for the College of Pharmacy are established by the dean and faculty of the college to assist students as they select courses and attempt to fulfill graduation requirements. Additional regulations may be adopted during the academic year or changes may be made to the following:

1. Students who wish to register for more than 19 hours of academic studies in a single quarter need the written permission of the dean of the College of Pharmacy.
2. A pharmacy student may take no more than eight quarter hours in any summer term with a maximum of twenty quarter hours, total, for all three summer terms.
3. A prerequisite for a Bach. of Sci./ Pharmacy Experiential Module (PHPR 570) and the advanced practice (PHPR 650) rotations and the Profession of Pharmacy (PHPR 303) is a certificate of registration as an Ohio pharmacy intern. The Ohio Board of Pharmacy may deny the issuance of the certificate if an individual has been convicted of a felony, has been convicted of violating any state or federal pharmacy or drug law, is not of good moral character and habits, is addicted to or abusing liquor or drugs, has been disciplined by the Ohio Board of Pharmacy pursuant to section 4729.16 of the revised code, or has been disciplined by any board of pharmacy (OAC 4729-5-04).
4. Students registered for an Experiential Module /Rotation (PHPR 570/650) who wish to register for any additional elective courses need the written permission of both experiential instructors, the department chair (of PHPR), and the dean of the College of Pharmacy prior to registering for the additional courses.
5. Students should not expect to register for courses that have conflicting time schedules. On rare occasions a student may be allowed to do so. The student will need the written permission of both the faculty members and the dean of the College of Pharmacy. Permission is never given to allow a student to recover from a bad grade, whether the need for a time conflict is created directly or indirectly.
6. Students are encouraged to register for activity courses in art, music, theatre, and health and physical education. There is no maximum number of activity course credits that may be used for fulfilling elective graduation requirements.
7. All pharmacy students in the Lower Division (P1 to P3 Ranking) must have a cumulative GPA of 2.00 or higher and a letter grade of "C" or better in all required BIOL, CHEM, MATH, STAT, PHYS, PHPR and PHBS courses prior to entering the P4 year. Those students not meeting this requirement will maintain the class rank of P3 and may not take any P4 level course work until all stated requirements are met.
8. The following regulations pertain to students in the Upper Division (P4 to P6 Ranking):
  - 8.1 All students earning an "F" grade in any module may not progress beyond that quarter. That module must be repeated and the grade replaced with a "C" or better. A student earning a second "F" grade (in the same or different module) will be dismissed from the College of Pharmacy.
  - 8.2 All students earning their first "D" grade in any module will be allowed to progress and will not be required to repeat that module. An exception to this rule is the Capstone Module (BSPC 546) wherein all students must earn a grade of "C" or better to progress.
  - 8.3 All students earning another deficient grade ("D" or "F") in another module may not progress and must repeat **both** modules in which they received the deficient grades.
  - 8.4 All students who receive their second deficient grade during the first part of a quarter (e.g. the first BSPC module of two normally taken in succession in a single quarter) are permitted to take the subsequent module in that quarter. However, they are not permitted to progress beyond that quarter until each of the deficient grades has been successfully replaced with a "C" or better.
  - 8.5 All students whose college academic record for required Upper Division modules includes three deficient grades that have not been successfully replaced with a "C" or better, will be dismissed from the College of Pharmacy.
9. The following regulations pertain to students in both the Lower Division and Upper Divisions (P1 to P6 Ranking):
  - 9.1 All students who are repeating courses or modules because of earned "D" or "F" grades as

- specified in Section 7 or 8 above, will have a maximum of three (3) opportunities (two repeat attempts) to earn a grade of "C" or better in those courses. Failure to earn a "C" or better grade after the second repeat attempt (third time total) will result in the students dismissal from the College of Pharmacy (see "Academic Standing," below).
- 9.2 All grades earned in the repeated BSPC, PHPR and PHBS courses/modules will be averaged with the initial grades in those courses for calculation of the students's cumulative grade point average (GPA).
  - 9.3 Except where noted, credit hours earned in repeated courses can be counted only one time among the total hours required for graduation.
  10. All students enrolled in either the first or second of two sequential modules offered in the same quarter may drop either module before, but no later than the 20th day of class in that module.

### Academic Policies for the Non-Traditional Doctor of Pharmacy Degree Program

The standard University guidelines are applicable to all non-traditional students with the following additions.

1. A pharmacist will have a maximum of three years to complete the didactic courses and a maximum of five years to complete the program.
2. Pharmacists must maintain a cumulative grade point average (GPA) of 2.00. The GPA will be calculated only from courses taken while enrolled in the non-traditional Doctor of Pharmacy program.
3. Pharmacists must maintain a current valid pharmacist's license, without disciplinary sanctions from any Board of Pharmacy, throughout the time enrolled in the program.
4. Non-traditional Doctor of Pharmacy courses may be taken only while enrolled in the non-traditional Doctor of Pharmacy program.
5. Credit earned while enrolled in the non-traditional Doctor of Pharmacy program cannot be transferred into the entry-level Doctor of Pharmacy program.

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## S/U Grade Option

Students may utilize the S/U grade option only as noted in the College of Pharmacy catalog course descriptions. Otherwise, students are not permitted to register for courses on an S/U basis if the course is offered on a graded basis.

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## Classification of Students

Students may be advanced to the following classifications upon meeting the stated requirements.

P-2: a minimum of 54 quarter hours of credit including completion of the following courses or their articulated equivalent: Chemistry 171, 172, and 173; Biology 121, 122; and Math 154.

P-3: a minimum of 108 quarter hours of credit including completion of the following courses or their articulated equivalent: Chemistry 251, 252, 253; Physics 120; and Biostatistics 156.

P-4: a minimum of 162 quarter hours of credit including completion of the following courses or their articulated equivalent: Biostatistics 256; Biology 124, 322 and 323; Biochemistry 341 and 342; Immunology 375; Microbiology 313; Physiology 331, 332 and 333; OTC's 331; Profession of Pharmacy 101, 102, 103, 201, 202, 203, 301, 302, 303\*; plus completion of all general education requirements.

\*The Profession of Pharmacy 203 must be completed prior to the start of PHPR 301. The Profession of Pharmacy 301, 302 and 303 sequence CAN NOT be taken concurrently with another Profession of Pharmacy course.

P-5: a minimum of 216 (202 B.S.Pharm.) quarter hours of credit. A cumulative GPA of 2.00 or higher and have successfully completed Biomedical Science and Patient Care (BSPC) 441, 442; PHBS 432, 444; and PHPR 401, 402 modules.

P-6: a minimum of 270 quarter hours of credit. A cumulative GPA of 2.00 or higher and have successfully completed Biomedical Science and Patient Care (BSPC) 543, 544, 545; PHPR 550 modules and received a letter grade of "C" or better in BSPC 546.

Other information relative to the requirements for reclassification of standing may be obtained in the office of Pharmacy Student Services of the College of Pharmacy.

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## Academic Standing

A student who fails to maintain the prescribed standards of scholarship will be subject to one of the following actions, namely: 1) probation, 2) continued probation, 3) suspension from the college, or 4) dismissal from the college.

Following the first quarter a student's cumulative grade point average (GPA) falls below 2.00, the student will be placed on probation. If a student on probation fails to obtain good academic standing (cumulative GPA 2.00 or higher) after the following quarter, the student will be placed on continued probation. If good academic standing is not achieved by the end of the following quarter,

the student should expect to be suspended. Any student with a quarterly GPA of less than 1.00 may be placed on probation or suspended. When a student is on probation, the college may impose special conditions for continued enrollment. Students on probation cannot participate in competitive activities of individuals, teams, or other groups officially designated as representing the University.

When action is taken to suspend a student, the suspension will be for a specified period of time after which the student will be eligible to apply for readmission. Readmission is not automatic. If readmission is granted, the faculty will establish specific conditions of academic performance expected of the student. A quarterly GPA of less than 2.00 in any of the first three quarters after readmission may lead to dismissal. Dismissal is a terminal action and the student is not eligible to apply for readmission to the College of Pharmacy at any time thereafter.

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## Dual Degree Programs

Information concerning undergraduate dual degree programs involving the College of Pharmacy appears on page 33 of this catalog. Students may receive further details in the Office of Pharmacy Student Services.

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## Student Services

The College of Pharmacy provides specialized services to students and alumni through the staff of the Office of Pharmacy Student Services, including college admissions, academic advising, personal counseling, career counseling, and job placement. The staff of the office also coordinates professional organization functions, student group activities, and serves as the focus for special project planning and implementation.

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## Student Conduct

Students enrolled in the College of Pharmacy are expected to uphold high professional standards. The abuse or possession of narcotics, stimulants, or hallucinogens without the supervision of his/her own physician is unacceptable conduct and can subject the student to dismissal. A student who has been convicted of a felony or who has violated any state or federal pharmacy or drug law can be dismissed from the college.

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## Special Notice

Because of rapid developments in the health professions, the curriculum and academic standards of the College of Pharmacy are constantly being reviewed by the faculty. The faculty of the college reserves the right, without advance notice, to change the content, duration and sequence of any course included in the curriculum, or to increase or decrease the number of credit hours leading to the degree. The faculty also reserves the right without advance notice to change the academic standards of the college.

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## Subject - Biomedical Science and Patient Care (BSPC)

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### 441 - BIOMEDICAL SCIENCE AND PATIENT CARE MODULE 1: CARDIOVASCULAR SYSTEM

*9.00 Credits*

Cardiovascular disease states and the therapeutic agents used in the diagnosis, treatment, and prevention of such diseases. Emphasis is placed on an understanding of the pharmacological rationale for the therapeutic treatment of cardiovascular disease.

Individual agents are explained based on pharmacology and chemical properties and how these characteristics influence their therapeutic utility in the treatment of cardiovascular disease. Prerequisites: PHBS 432, PHBS 444 and PPHR 402.

### 442 - BIOMEDICAL SCIENCE AND PATIENT CARE MODULE 2: INFECTIOUS DISEASE

*9.00 Credits*

An interdisciplinary course focusing on antibiotics and other chemicals used in the prophylaxis and treatment of infectious diseases. Antibacterial agents, antifungal agents, antiviral agents and antiparasitic agents will be covered. Individual drugs are discussed in terms of basic chemistry, mechanism of action, structure-activity relationships, modes of resistance, microbial susceptibility, therapeutic applications, pharmacokinetic properties, drug interactions and adverse effects. In-depth analysis of the pathophysiology of disease and treatment related to infectious disease covered in a standard medically related systems approach. Students are required to compare findings of current literature to standard text material, focus on problem solving/decision making based on case examples, calculate a drug dose and make necessary adjustments for unique disease states or special patient circumstances and select an appropriate regimen of choice based on cost effectiveness and ethical consideration. Investigational modes of therapy will also be covered for selected infectious diseases. Prerequisites: PHBS 432, PHBS 444, PPHR 402 and current CPR certification.

### **543 - BIOMEDICAL SCIENCE AND PATIENT CARE MODULE 3: THE CENTRAL NERVOUS SYSTEM AND SPECIAL SENSES**

#### *9.00 Credits*

An integrated approach to disease states primarily affecting the central nervous system and special senses, and the therapeutic agents used in the diagnosis, treatment, and prevention of such diseases. Emphasis is placed on an understanding of the pathophysiology of the disorders and the pharmacological rationale for their treatment. Individual agents are explained based on pharmacodynamic, pharmacokinetic and chemical properties and how these characteristics influence the therapeutic utility of these agents. Format includes case studies, student reports and traditional discussion sessions. Prerequisites: BSPC 441 and 442.

### **544 - BIOMEDICAL SCIENCE AND PATIENT CARE MODULE 4: THE ENDOCRINE AND MUSCULOSKELETAL SYSTEM**

#### *9.00 Credits*

An integrated approach to endocrine and musculoskeletal disorders, including the rational use of pharmacological agents to treat them. Comprehensive discussion of drug design and structure activity relationships is integrated with the therapeutic and toxicologic actions of the drugs. Basic concepts and principles of the pharmacodynamic and pharmacokinetic properties of the drugs used in these disease states will be discussed as they pertain to the endocrine and musculoskeletal systems. Prerequisites: BSPC 441 and 442.

### **545 - BIOMEDICAL SCIENCE AND PATIENT CARE MODULE 5: ONCOLOGY AND GASTROINTESTINAL SYSTEM**

#### *9.00 Credits*

The oncology and gastrointestinal components of this module are integrated approaches to the study of neoplastic and gastrointestinal diseases and the therapeutic agents used in the diagnosis, treatment, and prevention of such diseases. Emphasis is placed on an understanding of the pharmacological rationale for the therapeutic treatment of cancer and gastrointestinal disease. Individual diagnostic, therapeutic and preventive agents are characterized by their pharmacological and chemical properties and how these properties influence the therapeutic utility of these agents in the treatment of neoplastic and gastrointestinal diseases. Prerequisites: BSPC 543 and 544.

### **546 - BIOMEDICAL SCIENCE AND PATIENT CARE MODULE 6: CAPSTONE IN PHARMACY PRACTICE**

#### *9.00 Credits*

The module requires the student to utilize accumulated pharmaceutical education and apply learned principles to organize and synthesize relevant information to describe, optimize and critique drug therapy in unique and classic diseases. Information will be presented in written and oral, formal and informal formats. Activities include case presentations, reviews of "the literature", literature critiques and other formats that allow demonstration of proficiency in effective, safe, and "patient specific" application of drug therapy. Students work in small groups when possible to demonstrate interpersonal skills. Culminates with an encompassing final exam which is a prerequisite for clinical rotations. Prerequisites include admission to the Pharm.D. program and successful completion of BSPC 543, 544, 545 and PHPR 550 modules.

### **600 - SENIOR THESIS**

#### *1.00 to 4.00 Credits*

Students enrolled in the course will develop a research proposal containing a review of the relevant literature, a hypothesis, and a protocol for methodology to test the hypothesis. Research will be conducted and culminate in a written thesis and formal presentation. Prerequisite: Permission of instructor.

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## **DEPARTMENT OF PHARMACEUTICAL & BIOMEDICAL SCIENCES**

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Professors Faulkner, Kinder, Milks (*Chair*), L.Smith; Associate Professors Christoff, Knecht, Sprague; Assistant Professor Hrometz; Lecturer Myers

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### ***Subject - Pharmaceutical and Biomedical Sciences (PHBS)***

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*First number in parentheses is lecture hours per week,  
second number is laboratory hours per week.*

### **200 - SPIRITUALITY AND HEALTH**

#### *2.00 Credits*

Implications of spiritual outlook and practice on patient compliance, coping skills and other aspects of health care. Prerequisite: Permission of instructor.

## **210 - PHARMACEUTICAL SCIENCE TECHNIQUES**

### *2.00 Credits*

Laboratory techniques employed in research in the pharmaceutical sciences. Preparation for graduate studies in any of the related sciences. Prerequisites: P-2 status and permission of the instructor.

## **302 - MEDICAL TERMINOLOGY (3+0)**

### *3.00 Credits*

Medical terminology specifically, and scientific terminology in general. Emphasis on root words and affixes which have general and frequent occurrence in the communication of medicine, pharmacy, biology, chemistry, and related areas.

## **310 - DRUG ABUSE EDUCATION (2+0)**

### *2.00 Credits*

Development of skills in educating community groups regarding drugs and drug abuse. Emphasis on the development, mastery and delivery of concept-oriented lectures, and the effective use of learning materials in providing drug abuse education to various community groups, especially middle school and high school students. Background information, presentation techniques and approaches, and various current topics relating to drug abuse and chemical dependency. Prerequisite: BIOL 124

## **311 - SERVICE LEARNING IN DRUG ABUSE EDUCATION**

### *1.00 Credit*

Community service-oriented presentation of drug abuse education talks to various community groups, including middle school and high school students. Opportunity to further develop skills in conveying health information to the public, focusing on issues relating to drug abuse and chemical dependency. Can be repeated indefinitely. Prerequisite: PHBS 310 or concurrent enrollment in PHBS 310.

## **330 - ALTERNATIVE HEALTH CARE**

### *3.00 Credits*

Selected principles and practices of alternative (complementary) health care, including homeopathy, herbals, energy and touch therapies. Emphasis on implications for pharmacists. Prerequisite: Permission of the instructor.

## **341 - BIOCHEMISTRY 1 (4+0)**

### *4.00 Credits*

The chemistry of living organisms with emphasis on the human system. Topics include acid-base balance, buffers, chemistry of amino acids, proteins, enzymes, carbohydrates, lipids, vitamins, nucleic acids and porphyrins. Prerequisites: A "C" of better in CHEM 251, CHEM 252 and CHEM 253.

## **342 - BIOCHEMISTRY 2 (4+0)**

### *4.00 Credits*

The major metabolic processes that are essential for human life, including biochemical energetics, the electron transport system, Krebs's cycle, the metabolism of carbohydrates, lipids and amino acids, and the biosynthesis of purines, pyrimidines, nucleic acids and proteins. Biochemical genetics and genetic disorders are also covered. Prerequisite: PHBS 341.

## **350 - BASIC NUTRITION (3+0)**

### *3.00 Credits*

Basic principles of nutrition for pharmacy and nonpharmacy students. Topics include a description of essential nutrients, methods of evaluating individual dietary adequacy, and dietary methods for weight control.

## **351 - DIAGNOSTIC TESTS (3+0)**

### *3.00 Credits*

The use of biochemical tests as agents for the diagnosis of human disease states. The theory, methodology, utility, significance, and reliability of such tests are discussed. Prerequisite: PHBS 342 or permission of instructor.

## **370 - COLLOQUIUM IN BIOMEDICAL AND PHARMACEUTICAL SCIENCES**

### *1.00 Credit*

Student-presented seminars which review research topics of interest in the pharmaceutical and biomedical sciences or which review specific papers in the scientific literature. Preparation for graduate study in the pharmaceutical and biomedical sciences. Prerequisite: Permission of the instructor.

## **375 - IMMUNOLOGY (4+0)**

### *4.00 Credits*

Modern immunology and immunotherapy. The principles of basic and clinical immunology, historical background, host defense mechanisms, types of immune responses, nature of antigens and antibodies, antigen-antibody interactions leading to immunological disease, and transplantation and cancer immunology. The use of immunobiologicals currently available in the USA for prevention and treatment of most common infections and immunologic diseases. The role of biotechnology as a source of immunobiologicals will be discussed. Prerequisite: PHBS 341.

## **381 - NATURAL PRODUCTS 1 (4+0)**

### *4.00 Credits*

Medicinal constituents found in terrestrial and marine plant origin. Brief history and sources of selected major plant constituents, the chemical, biological properties and category of uses are presented. Prerequisite: Grade of "C" or better in PHBS 341 or equivalent.

### **382 - NATURAL PRODUCTS 2 (2+0)**

#### *2.00 Credits*

A continuation of Natural Products I dealing specifically with natural products found in both terrestrial and marine animals. Emphasis is on biomedicinals such as hormones and enzymes, and on the biotoxins elaborated from these animals. Prerequisite: PHBS 381.

### **431 - PHARMACEUTICAL SCIENCES**

#### **MODULE 1**

#### *8.00 Credits*

The physical pharmacy, pharmaceutical and biopharmaceutical aspects of a variety of drug delivery systems, predominantly peroral solution and solid dosage forms. The time-course of drug substances in various body compartments (pharmacokinetics) will be treated in a quantitative manner, and delivery system formulation factors which may affect drug pharmacokinetics (biopharmaceutics) will be discussed. Laboratory exercises introduce the basic pharmaceutical concepts and techniques necessary to prepare extemporaneous dosage forms, including solution, capsules, lotions and suspensions. The chemical, physical and biological properties of the ingredients used and their relationship to the final product will be discussed in order to facilitate preparation of elegant, stable, safe and effective products. Prerequisite: P-4 standing.

### **432 - PHARMACEUTICAL SCIENCES**

#### **MODULE 2**

#### *8.00 Credits*

A continuation of Pharmaceutical Sciences 1. The pharmaceutical, biopharmaceutical and pharmacokinetic aspects of a variety of drug delivery systems, predominantly suspensions, emulsions, aerosols, semisolids, transdermal, and controlled release dosage forms. Novel and experimental drug delivery systems also will be examined. The bioavailability and bio- and generic equivalence of peroral products. The basic principles, equipment and techniques involved in the preparation and administration of parenteral sterile dosage forms will be discussed. Laboratory exercises introduce the basic pharmaceutical concepts and techniques necessary to prepare extemporaneous dosage forms, including ointments, suppositories, and parenteral sterile dosage forms. The chemical, physical and biological properties of the ingredients used and their relationship to the final product will be discussed in order to facilitate preparation of elegant, stable, safe and effective products. Prerequisites: P-4 standing, PHBS 431, PHBS 443 and PHPR 401.

#### **441 - MEDICINAL PLANT PROPAGATION AND CULTIVATION (2+3)**

##### *3.00 Credits*

The economic, geographic, commercial, and biological aspects of plants as sources of drugs, spices and various natural chemical products. Common poisonous plants and potentially harmful toxic constituents of plant foodstuffs are discussed. Field trips and cultivation of medicinal plants. Required research of literature, writing and presentation of reports. Prerequisite: Permission of instructor.

#### **443 - BIOMEDICAL SCIENCES MODULE 1**

##### *8.00 Credits*

An interdisciplinary focus on the mechanisms by which diseases, drugs and chemicals alter normal biochemical and physiological processes. The sciences of pathophysiology, pharmacology, toxicology, and medicinal chemistry are integrated to provide an in-depth understanding of these mechanisms. The course progresses from factors affecting sub-cellular mechanisms to those of whole organ systems. Includes small group recitation and student-presented seminar sections in order to introduce the basic and clinical scientific literature and provide activities which illustrate the pharmacotherapeutic applications of the material. Prerequisite: P-4 status.

#### **444 - BIOMEDICAL SCIENCES MODULE 2**

##### *8.00 Credits*

Continuation of PHBS 443. Prerequisites: PHBS 431 and 443, and PPHR 401.

#### **502 - PRINCIPLES AND PRACTICE OF PUBLIC HEALTH (3+0)**

##### *3.00 Credits*

Individual and community aspects of public hygiene, including infections, epidemiology, prophylaxis, and discussion of major illnesses (nutritional, mental, environmental and occupational). Prerequisite: BIOL 313.

#### **511 - VETERINARY PHARMACY (2+0)**

##### *2.00 Credits*

The various pathological conditions peculiar to animals and the pharmaceuticals used in the treatment thereof. Prerequisite: Permission of instructor.

#### **530 - MANUFACTURING PHARMACY (1+6)**

##### *3.00 Credits*

The formulation and fabrication by mechanized methods of a variety of pharmaceutical dosage forms. Graded S/U. Prerequisite: Permission of the instructor.

#### **545 - DRUGS OF ABUSE (2+0)**

##### *2.00 Credits*

Major issues regarding drug abuse, with special emphasis on the specific agents of abuse, their sources, common distribution modes, patterns of substance abuse, pharmacological effects and mechanisms, toxicologic concerns, treatment modalities and approaches to drug abuse education. Prerequisite: BSPC 543.

#### **546 - INTRODUCTION TO GERIATRIC PHARMACOLOGY (2+0)**

##### *2.00 Credits*

Principles dealing with age-related physical and mental changes; pharmacokinetics, drug interactions, disease states and drug therapy, misuse and abuse of medication in the elderly. Prerequisite: Permission of instructor.

#### **562 - SURVEY OF RESEARCH AREAS IN THE PHARMACEUTICAL SCIENCES 1 (1+0)**

##### *1.00 Credit*

The research areas in the pharmaceutical, biomedical and pharmacy administration areas, and opportunities in these areas are defined. Team taught by pharmacy faculty and designed for Pharmacy and Arts and Sciences students interested in research careers. Graded S/U. Prerequisites: P-2 or sophomore standing.

#### **563 - SURVEY OF RESEARCH AREAS IN THE PHARMACEUTICAL SCIENCES 2 (1+0)**

##### *1.00 Credit*

Continuation of PHBS 562 with emphasis on the particular research interests of the faculty and presentations by outside speakers from academia, government, and industry. Graded S/U. Prerequisites: P-2 or sophomore standing.

#### **564 - SURVEY OF RESEARCH AREAS IN THE PHARMACEUTICAL SCIENCES 3 (1+0)**

##### *1.00 Credit*

Continuation of PHBS 563 with emphasis on the particular research interests of the faculty and presentations by outside speakers from academia, government and industry. Graded S/U. Prerequisite: P-2 or sophomore standing.

#### **565 - RESEARCH IN THE PHARMACEUTICAL AND BIOMEDICAL SCIENCES(0+2)**

##### *2.00 Credits*

For students who intend to pursue graduate study in pharmacology, toxicology or related biomedical areas. Participation in all aspects of the design, implementation, model preparation, instrumentation, and reporting of specific research problems. Can be repeated for a maximum of 12 hours.



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**571 - SEMINAR IN PSYCHOPHARMACOLOGY (2+0)**

*2.00 Credits*

Presentations of papers and discussions of topics of interest. Current papers in mental illness. Psychedelic drug effects and pharmacological research are discussed. Prerequisite: BSPC 543.

**572 - SEMINAR IN TOXICOLOGY (2+0)**

*2.00 Credits*

Presentation of papers and discussion of topics. Current events and relevant topics in clinical, occupational industrial, and environmental toxicology are discussed. Prerequisite: PHBS 444.

**573 - SEMINAR IN PEDIATRIC PHARMACOLOGY (2+0)**

*2.00 Credits*

Common pediatric medical disorders and their management with special reference to the pharmacologic basis of pediatric medicine. Prerequisite: Permission of the instructor.

**575 - SEMINAR IN PROBLEMS OF DRUG ABUSE (2+0)**

*2.00 Credits*

Adverse effects of illicit drugs, particularly the long-term consequences of drug abuse. The problems of drug abuse from pharmacologic and biomedical aspects are discussed. This course may be repeated an indefinite number of times. Prerequisite: Permission of the instructor.

**590 - SPECIAL TOPICS IN PHARMACEUTICAL AND BIOMEDICAL SCIENCES**

*1.00 to 3.00 Credits*

Can be repeated as the subject varies. Prerequisite: Permission of the instructor.

**594 - SEMINAR IN PHARMACEUTICAL AND BIOMEDICAL SCIENCES**

*1.00 to 3.00 Credits*

Can be repeated as the subject varies. Prerequisite: Permission of the instructor.

**597 - INDEPENDENT STUDY- PHARMACEUTICAL AND BIOMEDICAL SCIENCES**

*1.00 to 3.00 Credits*

Can be repeated as the subject varies. Prerequisite: Permission of department chairman and accumulative grade point average of 2.50.

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**DEPARTMENT OF PHARMACY PRACTICE**

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Professors Bryant, K. Kier, Previte, L. Savino; Associate Professors Allison, Broedel-Zaugg, Jones, Kisor, Lucas, Sullivan, Sweeney; Assistant Professor Stanovich; Visiting Assistant Professor Roecker; Clinical Professors Blumer (shared), Reed (shared), P. Smith (shared); Associate Clinical Professor Hulisz (shared); Assistant Clinical Professors Ballentine (shared), Castle (shared), Caudill (shared), Crea (shared), Draeger (shared), Gibson (shared), Kaufflin (shared), Letting (shared), Hunsinger-Norris (shared), O'Connell (shared), Parker (shared), Pierce (shared), Plogsted (shared), Stockman (shared); Instructor T. Kier; Assistant Instructor M. Turner

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***Subject - Pharmacy Practice (PHPR)***

**101 - THE PROFESSION OF PHARMACY 1**

*1.00 Credit*

The profession of pharmacy, the delivery of patient care, and the operation of the University and College of Pharmacy. Traditional classroom presentations reinforced through structured experiential rotations in a variety of health care and community service sites.

**102 - THE PROFESSION OF PHARMACY 2**

*1.00 Credit*

Continuation of PHPR 101. Prerequisite: PHPR 101.

**103 - THE PROFESSION OF PHARMACY 3**

*1.00 Credit*

Continuation of PHPR 102. Prerequisite: PHPR 102.

**201 - THE PROFESSION OF PHARMACY 4**

*2.00 Credits*

Continuation of professional development and understanding of pharmacy services and patient care delivery. Addresses issues relevant to the preparation for pharmacy internship and advanced pharmacy course work. Prerequisite: PHPR 103.

**202 - THE PROFESSION OF PHARMACY 5**

*2.00 Credits*

Continuation of PHPR 201. Prerequisite: PHPR 201.

**203 - THE PROFESSION OF PHARMACY 6**

*2.00 Credits*

Continuation of PPHR 202. Prerequisite: PPHR 202.

**230 - ETHICS IN PROFESSIONAL PRACTICE (2+0)**

*2.00 Credits*

Guided discussions show that there are ethical problems in life and that there are better and worse ways of dealing with those problems.

**241 - CONTEMPORARY PHARMACY PRACTICE**

*2.00 Credits*

Multiple practice settings including retail, institutional, manufacturing, distribution, association, government and how each is implementing a pharmaceutical care mission. May be repeated for up to 6 credit hours.

**301 - THE PROFESSION OF PHARMACY 7**

*2.00 Credits*

Continued professional development, understanding, and reinforcement of pharmacy services and patient care delivery. The functional practice of pharmacy, including product (medication and information) distribution systems and evaluation of their quality and impact on professional, legal, patient care. Prerequisite: PPHR 203.

**302 - THE PROFESSION OF PHARMACY 8**

*2.00 Credits*

Continuation of PPHR 301. Prerequisite: PPHR 301.

**303 - THE PROFESSION OF PHARMACY 9**

*2.00 Credits*

Sixty documented experiential contact-hours providing skills development in pharmaceutical patient care. Credit given upon successful completion of a comprehensive final examination. Prerequisite: PPHR 302 and a valid pharmacy internship license.

**331 - INTRODUCTION TO OTC PRODUCTS**

*4.00 Credits*

Development of appropriate counseling and guidance to patients who desire to conduct self-medication or self-therapy with non-prescription drug products/devices. Prerequisite: PPHR 302.

**401 - PATIENT CARE ASSESSMENT MODULE 1**

*2.00 Credits*

Preparation for subsequent therapeutic oriented modules. Development and enhancement of analytical and communicative skills required to prepare a drug therapy problem list. Prerequisite: PPHR 303.

**402 - PATIENT CARE ASSESSMENT MODULE 2**

*2.00 Credits*

Various aspects of physical assessment as they pertain to the delivery of "pharmaceutical care". Prerequisite: PPHR 401.

**478 - OUTPATIENT PHARMACY SERVICE (0+3)**

*1.00 Credit*

A laboratory to serve the needs of the Health Center through the operation of the Student Health Pharmacy. Specific components include: the dispensing of prescriptions, patient counseling and patient profile maintenance. For students with limited or no internship experience. Prerequisites: Valid Ohio intern license. May be repeated for up to four credit hours.

**550 - PHARMACY ADMINISTRATION MODULE**

*9.00 Credits*

An interdisciplinary approach to the practice of pharmacy as it fits into the contemporary healthcare system and the business environment. Includes theoretical concepts as well as practical methodology techniques to assess the external and internal economic, social, philosophical, ethical, and legal influences on the practice. Planning, evaluating, and decision making through financial report analysis and case study is stressed. Prerequisites: BSPC 543 and 544.

**570 - BACHELOR OF SCIENCE/PHARMACY EXPERIENTIAL MODULE**

*18.00 Credits*

Multi-dimensional experiences in hospital and community-based contemporary pharmacy practice. Students will apply principles learned during the didactic curriculum within actual patient care/dispensing environments. All experiences are off-campus. Required transportation and housing to be arranged by the student. Prerequisites: P-5 standing, valid Ohio Intern License and updated immunizations, as required by teaching site and/or state and federal regulatory agencies. Students must have successfully completed BSPC 543, 544 and 545 and PPHR 550 modules.

**590 - SPECIAL TOPICS IN PHARMACY PRACTICE**

*1.00 to 16.00 Credits*

Can be repeated as the topic varies. Prerequisite: Permission of the instructor.

**594 - SEMINAR IN PHARMACY PRACTICE**

1.00 to 3.00 Credits

Can be repeated as the topic varies.

Prerequisite: Permission of the instructor.

**597 - INDEPENDENT STUDY-PHARMACY PRACTICE**

1.00 to 16.00 Credits

Can be repeated as the topic varies.

Prerequisites: Permission of department chair and 2.50 accumulative grade point average.

**650 - ADVANCED PRACTICE ROTATION**

6.00 Credits

Full-time experiential program emphasizing delivery of pharmaceutical care in primary, secondary and tertiary patient care settings, as well as a means of integrating facts and principles received from antecedent courses. The process will occur in both institutional and ambulatory settings. At each practice setting, the student is expected to become a functioning component of the ongoing pharmaceutical care services through faculty instruction, self-learning, and by observing the modeling of attendant faculty members. Prerequisites: BSPC 543, 544, 545, 546 and PHPR 550. Students must register for the course nine times for a total of 54 credits.

**701 - ORIENTATION TO DOCTOR OF PHARMACY (NON-TRADITIONAL)**

.00 Credits

Orientation to the non-traditional Doctor of Pharmacy program and completion of a prior learning assessment (PLA) portfolio (documentation of the pharmacists' experience and accomplishments). The portfolio is a requirement for continuation in the program. Prerequisite: Admission to the non-traditional Doctor of Pharmacy program.

**702 - SEMINAR IN ACADEMIC PROGRAMS DEVELOPMENT**

.00 Credits

For NTDP students not in a didactic course on clinical rotation to ensure continuous enrollment tracking. May be repeated a maximum of three consecutive quarters per academic year.

**710 - BIostatISTICS**

3.00 Credits

Basic statistical procedures and more advanced statistical methods used in the pharmaceutical and medical sciences. Application of statistical methods in the development of research design and evaluation of clinical studies. Prerequisite: PHPR 701.

**715 - SPECIAL TOPICS IN PHARMACY PRACTICE**

1.00 to 3.00 Credits

Internet based course clinically or disease oriented. Can be repeated as the topic varies. Prerequisites: PHPR 701.

**720 - DRUG LITERATURE EVALUATION**

3.00 Credits

Drug information sources (including the primary scientific literature). Processes used to make authoritative judgments based on information provided from principles of research methodology. Application of epidemiologic methods to the characteristics and events of drug use. Prerequisite: PHPR 701.

**725 - INDEPENDENT STUDY IN PHARMACY PRACTICE**

3.00 Credits

Internet based course for independent research efforts. Can be repeated as the topic varies. Prerequisite: PHPR 701.

**730 - PHARMACOKINETICS**

3.00 Credits

Use of mathematical and computer modeling to explore the derivation of principles. Specific pharmacokinetic parameters of a group of drugs is discussed by investigating pharmacokinetic research literature. Application of concepts to dosing patients is emphasized and specific case studies are included. Prerequisite: PHPR 701.

**740 - PHYSICAL ASSESSMENT**

3.00 Credits

Preparation for clerkship in pharmacy practice. Experiences in various aspects of physical assessment. Prerequisite: PHPR 701.

**750 - PATHOPHYSIOLOGY AND THERAPEUTICS: CARDIOLOGY**

3.00 Credits

Physiology and pathophysiology of the cardiovascular disease process covered in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PHPR 701.

## **755 - PATHOPHYSIOLOGY AND THERAPEUTICS: RENAL**

### *3.00 Credits*

Physiology and pathophysiology of the renal disease process covered in standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PPHR 701.

## **760 - PATHOPHYSIOLOGY AND THERAPEUTICS: INFECTIOUS DISEASE**

### *3.00 Credits*

Physiology and pathophysiology of the infectious disease process in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PPHR 701.

## **765 - PATHOPHYSIOLOGY AND THERAPEUTICS: CENTRAL NERVOUS SYSTEM/PSYCHIATRIC DISEASES**

### *3.00 Credits*

Physiology and pathophysiology of the central nervous system and psychiatric disease process covered in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard test material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PPHR 701.

## **770 - PATHOPHYSIOLOGY AND THERAPEUTICS: RESPIRATORY**

### *3.00 Credits*

Physiology and pathophysiology of the respiratory process covered in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PPHR 701.

## **775 - PATHOPHYSIOLOGY AND THERAPEUTICS: ENDOCRINE**

### *3.00 Credits*

Physiology and pathophysiology of the endocrine system disease process covered in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to

standard test material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PPHR 701.

## **780 - PATHOPHYSIOLOGY AND THERAPEUTICS: GI TRACT/NUTRITION**

### *3.00 Credits*

Physiology and pathophysiology of the gastrointestinal tract disease process and nutritional support covered in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PPHR 701.

## **785 - PATHOPHYSIOLOGY AND THERAPEUTICS: ONCOLOGY**

### *3.00 Credits*

Physiology and pathophysiology of the cancer disease process covered in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatment of choice and investigational modes of therapy. Prerequisites: PPHR 701.

## **790 - PATHOPHYSIOLOGY AND THERAPEUTICS: DERMATOLOGY/OPHTHALMIC**

### *3.00 Credits*

Physiology and pathophysiology of disease processes, including dermatology, soft tissue, and ophthalmic, covered in standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisite: PPHR 701.

## **800 - ADVANCED PRACTICE ROTATIONS**

### *5.00 to 6.00 Credits*

Experiential program emphasizing delivery of pharmaceutical care in primary, secondary and tertiary care settings. At each practice setting, the pharmacist is expected to become a functioning component of the ongoing pharmaceutical care services through faculty instruction and self-learning. Prerequisites: PPHR 701, 710, 720, 730, 740, 750, 755, 760, 765, 770, 775, 780, 785 and 790.