Course Descriptions

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ACT. ACT

ACT-101. PROGRAM

A special program for students from Pennsylvania who need academic and financial support, the [[ACT-101]] Program allows educationally underprepared students to improve their skills in verbal and written communication, reading comprehension, mathematics, and problem solving, all in an effort to acquaint these students with and help them adjust to the many new experiences associated with a college education. The program provides for tutoring and counseling to enhance the student's potential for success in the college environment. Inquiries about [[ACT-101]] should be directed to the [[ACT-101]] Office in Conyngham Hall or to the Office of Admissions.

ABBA. ACCELERATED BACHELOR OF BUSINESS ADMINISTRATION (ABBA)

ABBA-151. ENTREPRENEURSHIP AND INNOVATION
Credits: 3

This course takes students through the entrepreneurial process from the creative practice of developing a business concept, to planning the venture, to launching and operating the business, to harvest and closure of the firm. Students learn how businesses operate through the study of functional areas such as marketing, management, human resources, accounting, finance, and operations. Most importantly, students learn and experience how to integrate the functional areas by tracking information and performance using financial statements.

ABBA-152. THE LEADERSHIP PROCESS
Credits: 3

This course takes an interdisciplinary approach to understanding the complex process of leadership. Students will have the opportunity to explore both leadership theory and the practical application of leadership within different contexts (i.e. group, community, not-for-profit, small business and large organizational environments). The course will also focus on current issues that impact the leadership process including culture, diversity, and global perspectives. Additionally, the course will explore skills and behaviors associated with leadership including ethical decision-making, communication, influences, conflict resolution, and motivation.

ABBA-153. BUSINESS COMMUNICATIONS
Credits: 3

This course emphasizes written and oral communications used in business. Students practice writing major business correspondence, including letters containing persuasive requests and refusals, inquiries, orders, sales, applications, credit, collection, and goodwill. Investigative techniques of research and analytical report writing are examined. Students learn the major techniques of effective oral presentations - such as organizing for impact, gaining and keeping audience attention, multimedia applications, and adapting to cross-cultural audiences.

ABBA-154. BUSINESS ECONOMICS
Credits: 3

This course introduces the student to macroeconomic and microeconomic theories and principles. Core issues in both areas of Economics such as supply and demand, fiscal policy and monetary policy, employment, and pricing and output determination are explored in a business environment context.

ABBA-161. FINANCIAL ACCOUNTING
Credits: 3

This course studies the nature, function, and environment of accounting, including the accounting information system, account analysis, and decision-making. The course also provides an understanding of accounting issues and objectives for proper interpretation and analysis of financial accounting information.

ABBA-162. MANAGERIAL ACCOUNTING
Credits: 3

This course develops managerial accounting as an internal tool used to generate information for managerial planning and control. Students will develop an understanding of how costs flow through the manufacturing process and how financial and non-financial information is used to make budgeting and other managerial accounting decisions.

Pre-Requisites

[[ABBA-161]] with a minimum grade of 2.0

ABBA-202. PERSONAL AND PROFESSIONAL DEVELOPMENT I
Credits: 2

This is the first part of a two course series on Personal and Professional Development and explicitly targets personal and professional competency assessment, development, practice and evaluation. This course will challenge students to become self-aware in areas including: personality style, leadership style, team oriented qualities. Self-awareness and examination will be expanded and consistently reviewed and will establish the discipline of lifelong learning, goal setting and planning.

ABBA-221. PRINCIPLES OF MARKETING
Credits: 3

This course provides an introduction to the planning and activities of marketing. The course will provide an understanding of the dynamic role marketing plays in the global and national economy as well as the organization. The student will have the opportunity to build a knowledge base about the following areas: strategic marketing, research, consumer behavior, segmentation and targeting, marketing mix planning, the selling process, implementation, and evaluation. Marketing challenges, ethical thinking and action, and global dimensions of the practice of marketing and retailing will be identified.

ABBA-235. THE LEGAL ENVIRONMENT AND BUSINESS LAW
Credits: 3

This course provides a foundation for business managers to operate within the legal environment in which all businesses in our society function. It provides an overview of law and our legal system, the lawmaking and adjudicatory processes, and the roles of economic, social, and political forces in the shaping of constraining legal rules and regulations. It also provides a study of the laws protecting consumers and employees; and the law of contracts, sales, and business organizations.

ABBA-240. CORPORATE FINANCE
Credits: 3

This course provides a study of the financial theories and decision-making models relating to: financial analysis and planning; working capital management; cash budgeting; capital asset acquisitions; capital asset financing; cost of capital; capital structuring; acquisitions; divestitures; and reorganizations.

ABBA-251. PRINCIPLES OF MANAGEMENT
Credits: 3

This course introduces the theory and practice of managing organizations. Students analyze the concepts required in overseeing a company including planning, organizing, and controlling. Interdisciplinary in nature, social and ethical dimensions of managing are also examined.

Pre-Requisites

[[ABBA-151]] with a minimum grade of 2.0

ABBA-257. INFORMATION TECHNOLOGY FOR BUSINESS
Credits: 3

This course explores the assumptions, concepts and theories of information technologies for digital business in the knowledge economy. Topics will include examining critical issues of communication and connectivity of information systems for the organization from both the strategic and technical perspectives. Digital opportunities for organizational connectivity, development of standards and motivating strategic alliances will be emphasized.

ABBA-319. STATISTICS FOR BUSINESS
Credits: 3

This course serves as an introduction to the primary calculations and tools needed in business and economics. Topics include, but are not limited to, algebraic functions, interest rates, defining and describing data, numerical and graphical summaries of data, hypothesis testing, and regression and correlation analysis. Mathematical modeling in the business environment is emphasized.

ABBA-352. PRODUCTION AND OPERATIONS IN BUSINESS
Credits: 3

This course introduces principles of decision-making, how competition is enhanced, product and process development and management, quality management, and fundamentals of supply chain and inventory management.

Pre-Requisites

[[ABBA-319]] with a minimum grade of 2.0

ABBA-353. MANAGEMENT OF HUMAN RESOURCES
Credits: 3

This course deals with acquiring skills and understanding of the planning and technologies involved with local, regional, national, and global human resources management. Topics such as selection and recruitment, and job analysis and design are explored. Also included are appraising and rewarding performance, compensation and benefits, and labor management relations.

Pre-Requisites

[[ABBA-251]] with a minimum grade of 2.0

ABBA-354. ORGANIZATIONAL STUDIES
Credits: 3

This course emphasizes organizational theory and structure enhancing the student's ability to take action in organizations. The role of the employee and manager in the organizational change process will be discussed, highlighting the complexity of change. Topics such as motivation, risk, social influence, communication, organizational structure, team dynamics, leadership, culture, and power will be presented.

Pre-Requisites

[[ABBA-251]] with a minimum grade of 2.0

ABBA-358. INTERNATIONAL BUSINESS MANAGEMENT
Credits: 3

This course is an introduction to the field of international business. It provides an overview of the world economy; trade channels; and the effects of economic, political, and the social environment on international management. It also provides an insight to problems that exist in international operations, as well as the role of government in fostering international business.

Pre-Requisites

[[ABBA-251]] with a minimum grade of 2.0

ABBA-402. PERSONAL AND PROFESSIONAL DEVELOPMENT II
Credits: 2

This is the second part of a two course series on Personal and Professional Development and explicitly targets personal and professional competency assessment, development, practice and evaluation. This course will expose you to a series of experts in Leadership in order to examine your own leadership competencies as well as learning about the legacy you leave when you move to later jobs and positions.

Pre-Requisites

A grade of 2.0 or better in ABBA 202

ABBA-461. BUSINESS STRATEGY AND DECISION-MAKING
Credits: 3

This first capstone course integrates the functional areas of business from the perspective of top management. Emphasis is on the role of management in the formation and execution of strategic plans and a particular emphasis on improving a company's performance. ADVISOR PERMISSION REQUIRED.

Pre-Requisites

[[ABBA-354]] with a minimum grade of 2.0

ABBA-462. PROFESSIONAL BUSINESS EXPERIENCE
Credits: 3

This second capstone course is a professional business experience in which students apply their accumulated knowledge, skills, and abilities in a private or public organization related to the students' academic objectives and career goals. The course will include cooperative education, independent study, and/or an experiential component. ADVISOR PERMISSION REQUIRED

Pre-Requisites

[[ABBA-251]] with a minimum grade of 2.0, [[ABBA-221]] with a minimum grade of 2.0, [[ABBA-240]] with a minimum grade of 2.0

ACC. ACCOUNTING

ACC-151. INTEGRATED MANAGEMENT EXPERIENCE I
Credits: 3
Terms Offered: Fall

Integrated Management Experience is a two-semester sequence that takes you through the entrepreneurial process from creating a business concept to planning the venture to launching and operating the business to harvest and closure of the firm. You learn how businesses plan and operate through the study of functional areas such as marketing, management, human resources, accounting and finance, and operations. Most importantly, you will learn and experience how the pieces fit together through integrating the functional areas tracking information and performance using financial accounting principles. Cross listed with [[ACC-151]] and [[ENT-151]].

ACC-152. INTEGRATED MANAGEMENT EXPERIENCE II
Credits: 3
Terms Offered: Spring

Integrated Management Experience is a two-semester sequence that takes you through the entrepreneurial process from creating a business concept to planning the venture to launching and operating the business to harvest and closure of the firm. You learn how businesses plan and operate through the study of functional areas such as marketing, management, human resources, accounting and finance, and operations. You develop a clear understanding of the importance of accounting cycles and how financial accounting principles provide not only information but an integrating thread for all types of organizations. Cross listed with [[BA-152]] and [[ENT-152]].

Pre-Requisites

[[ACC-151]] / [[BA-151]] / [[ENT-151]] with a minimum grade of 2.0

ACC-161. FINANCIAL ACCOUNTING AND DECISION-MAKING
Credits: 3

This is a study of the nature, function, and environment of accounting, including the accounting information system, account analysis, and decision-making. The course provides an understanding of accounting issues and objectives for proper interpretation and analysis of financial accounting information.

ACC-162. MANAGERIAL ACCOUNTING AND DECISION-MAKING
Credits: 3

Managerial accounting is an internal tool used to generate information for managerial planning and control. Students will develop an understanding of operating and capital budgets, standard costs, incremental concepts, relevant costs, transfer pricing, and responsibility and profit center reports as a means of analysis as well as techniques of measurement.

Pre-Requisites

[[ACC-161]] with a minimum grade of 2.0

ACC-201. INTERMEDIATE ACCOUNTING
Credits: 3
Terms Offered: Fall

A study of the accounting information system and the accounting standards applicable to corporate balance sheet accounts and their related counterparts that result in revenue and expense recognition on the income statement and statement of retained earnings. Course topics include the financial accounting standards, financial statement preparation, cash and receivables, inventories and cost of goods sold, and plant and depreciation.

Pre-Requisites

[[ACC-161]] with a minimum grade of 2.0

ACC-202. INTERMEDIATE ACCOUNTING II
Credits: 3
Terms Offered: Spring

This course is a study of the accounting standards applicable to intangible assets, liabilities, and stockholders' equity. Also, it focuses on the application of generally accepted accounting principles that relate to various technical reporting areas within financial statements. Emphasis is placed on technical standards and the necessary disclosure requirements for these reporting areas. Course topics include earnings per share, securities that can dilute earnings per share, corporate investments, and accounting for corporate income taxes and pensions.

Pre-Requisites

[[ACC-201]] with a minimum grade of 2.0.

ACC-219. FINANCIAL STATEMENT ANALYSIS
Credits: 3

This course will focus on corporate financial reporting, evaluation, financial planning, accounting policies and practices, and other current issues. The interplay between accounting and corporate finance will be emphasized. The course will teach you how to use financial statement information for firm valuation and other economic decisions. The course will also help you understand and analyze the issues that corporate managers face as they design and implement financial reporting strategies, increasing your ability to assess accounting quality. This course will provide you with tools to analyze and exploit information in corporate financial statements.

Pre-Requisites

[[ACC-162]], [[FIN-240]] both with a minimum grade of 2.0

ACC-301. ADVANCED FINANCIAL ACCOUNTING
Credits: 3

A comprehensive review and analysis for various accounting issues relating to corporate consolidations, partnerships, governmental units, non-profit organizations, estates, trusts, and bankruptcies. Extensive computerized applications are an integral part of this course.

Pre-Requisites

[[ACC-202]] with a minimum grade of 2.0.

ACC-311. ADVANCED MANAGERIAL ACCOUNTING
Credits: 3
Terms Offered: Fall

Advanced treatment of managerial accounting topics with emphasis on generation, communication, and use of information to assist management in performance of the planning and control function. Information systems design, budgeting, variance analysis, and direct costing concepts are covered.

Pre-Requisites

[[ACC-162]] with a minimum grade of 2.0

ACC-321. TAXES
Credits: 3
Terms Offered: Fall

Introduction to the Internal Revenue Code for individuals and sole-proprietorships. Preparation of individual tax returns based on the current tax law, regulations, and revenue ruling letters. Introduction to tax research using various traditional and electronic reference services.

Pre-Requisites

[[ACC-161]] with a minimum grade of 2.0

ACC-322. ADVANCED TAXES
Credits: 3
Terms Offered: Spring

Introduction to certain tax laws as they apply to Corporations, S Corporations, and Partnerships. This involves developing a thorough understanding of tax research and how tax planning may help the financial entity to minimize tax liability.

Pre-Requisites

[[ACC-321]] with a minimum grade of 2.0

ACC-331. AUDITING
Credits: 3
Terms Offered: Fall

To understand the most important concepts in auditing and how they are used in decision making, evidence accumulation and reporting. This entails understanding the concepts, methods, and processes of control that provide for the accuracy and integrity of financial data and the safeguarding of business assets, along with understanding the nature of attest services and the conceptual and procedural bases for performing them.

Pre-Requisites

[[ACC-202]] with a minimum grade of 2.0.

ACC-341. ACCOUNTING INFORMATION SYSTEMS
Credits: 3
Terms Offered: Spring

To develop a solid understanding of and appreciation for the use of accounting information employed to process and sort business events so as to provide information for the functions of financial reporting, internal responsibility accounting, and decision support. This understanding includes applications via spreadsheets, databases, general ledgers, and the internet.

Pre-Requisites

[[ACC-162]] and [[MGT-251]]

ACC-397. SEMINAR
Credits: 1-3

One to three credits

ACC-462. ACCOUNTING INTERNSHIP
Credits: three or six

This internship course consists of professional business experience in which students apply their accumulated knowledge, skills and abilities in an organization related to the students' academic objectives and career goals. This course requires Cooperative Education approval as well as approval of the academic advisor, the department chair and the faculty advisor for the course.

Pre-Requisites

[[ACC-202]] with a minimum grade of 2.0

AS. AEROSPACE STUDIES

AS-101. HERITAGE AND VALUES OF THE UNITED STATES AIR FORCE I (FALL)
Credits: 1
Terms Offered: Fall

Survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, missions and organization of the Air Force.

Pre-Requisites

None

AS-102. FOUNDATIONS OF THE USAF II (SPRING)
Credits: 1

Survey course looking at the origin and organization of the Air Force. Current topics relate to an understanding of the Air Force and the requirements of qualities possessed by officers.

Pre-Requisites

None

AS-103. LEADERSHIP LABORATORY (FALL)
Credits: 0

An instructional program that prepares an individual to undertake the broad range of tasks associated with military leadership and management. Course is the required lab component to AS 101 course.

Pre-Requisites

None

AS-104. LEADERSHIP LABORATORY (SPRING)
Credits: 0

An instructional program that prepares an individual to undertake the broad range of tasks associated with military leadership and management. Course is the required lab component to AS 102 course.

Pre-Requisites

None

AS-201. TEAM AND LEADERSHIP FUNDAMENTALS I (FALL)
Credits: 1
Terms Offered: Fall

Focuses on laying the foundation for teams and leadership. The topics include skills that will allow cadets to improve their leadership on a personal level and within a team. The purpose is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate.

Pre-Requisites

None

AS-202. EVOLUTION OF USAF AIR AND SPACE POWER II (SPRING)
Credits: 1

Survey course examines the history and heritage of the United States Air Force from an historical perspective . Course covers period from Vietnam War to the present.

Pre-Requisites

None

AS-203. LEADERSHIP LABORATORY (FALL)
Credits: 0

An instructional program that prepares an individual to undertake the broad range of tasks associated with military leadership and management. Course is the required lab component to AS 201 course.

Pre-Requisites

None

AS-204. LEADERSHIP LABORATORY (SPRING)
Credits: 0

An instructional program that prepares an individual to undertake the broad range of tasks associated with military leadership and management. Course is the required lab component to AS 202 course.

Pre-Requisites

None

AS-240. AFROTC FIELD TRAINING (4-WEEK SUMMER SESSION)
Credits: 3

Intensive study of military education, experience in leadership and management at an active duty installation.

Pre-Requisites

[[AS-101]], [[AS-102]], [[AS-201]], and [[AS-202]]; successful completion of an interview with the Professor of Aerospace Studies

AS-301. LEADING PEOPLE AND EFFECTIVE COMMUNICATION I (FALL)
Credits: 3
Terms Offered: Fall

Teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication.

Pre-Requisites

Permission of AFROTC Department.

AS-302. LEADING PEOPLE AND EFFECTIVE COMMUNICATION II (SPRING)
Credits: 3
Terms Offered: Spring

Teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication.

Pre-Requisites

Permission of AFROTC Department.

AS-303. LEADERSHIP LABORATORY (FALL)
Credits: 0

An instructional program that prepares an individual to undertake the broad range of tasks associated with military leadership and management. Course is a required lab component for the Air Force ROTC program.

Pre-Requisites

Permission of the AFROTC Department

AS-304. LEADERSHIP LABORATORY (SPRING)
Credits: 0

An instructional program that prepares an individual to undertake the broad range of tasks associated with military leadership and management. Course is a required lab component for the Air Force ROTC program.

Pre-Requisites

Permission from AFROTC Department.

AS-401. NATIONAL SECURITY AFFAIRS / PREPARATION FOR ACTIVE DUTY I (FALL)
Credits: 3
Terms Offered: Fall

Designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare the cadets for Active Duty.

Pre-Requisites

Permission of the AFROTC Department.

AS-402. NATIONAL SECURITY AFFAIRS / PREPARATION FOR ACTIVE DUTY II (SPRING)
Credits: 3
Terms Offered: Spring

Designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare the cadets for Active Duty.

Pre-Requisites

Permission of the AFTROTC Department.

AS-403. LEADERSHIP LABORATORY (FALL)
Credits: 0

An instructional program that prepares an individual to undertake the broad range of tasks associated with military leadership and management. Course is a required lab component for the Air Force ROTC program.

Pre-Requisites

Permission of the AFROTC Department.

AS-404. LEADERSHIP LABORATORY (SPRING)
Credits: 0

An instructional program that prepares an individual to undertake the broad range of tasks associated with military leadership and management. Course is a required lab component for the Air Force ROTC program.

Pre-Requisites

Permission of the AFROTC Department.

ANT. ANTHROPOLOGY

ANT-101. INTRODUCTION TO ANTHROPOLOGY
Credits: 3

A general survey of the processes that generate human cultural and biological variation through time and among contemporary human groups. An introduction to cultural and physical anthropology, archaeology, and anthropological linguistics.

ANT-102. CULTURAL ANTHROPOLOGY
Credits: 3

A detailed examination of the methods and theories employed in the description and comparison of human cultures, as applied to problems in intercultural relations. Course content is based upon case and cross-cultural studies.

ANT-211. ANTHROPOLOGY THROUGH FILM
Credits: 3

A general survey of the use of still photography and cinematography in the depiction of the content of various cultures.

ANT-212. PEOPLES AND CULTURES OF THE WORLD
Credits: 3

An overview of social organizations, ethnicity, and cultural developments in various regions of the world: North American native Americans, the Middle East, Africa, Latin America, Asia. Topics are rotated. The contributions of ecological, economic, political and ideological factors to the region's social system are examined in regard to present cultural obligations.

ANT-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See the Cooperative Education section of this Bulletin for placement procedures.)

Pre-Requisites

Sophomore standing, minimum 2.0 cumulative average, consent of academic advisor, and approval of placement by the department chairperson.

ART. ART

ART-198/289/398. TOPICS IN ART
Credits: Varies with topic.

A study of topics of special interest not extensively treated in regularly offered courses. Recent
studio topics have included Life Drawing, Mural Painting, Color Photography, and Ceramic Sculpture. Past topics in art history have included Modern Architecture, A History of Surrealism, and Nineteenth-Century Art. Special topics in art.
Click here for course fee. Course fee applies only to studio courses.

ART-101. EXPERIENCING ART
Credits: 3

Lectures and discussion on the elements of art and the forerunners of modern and contemporary art. Two- and three-dimensional studio work is explored through the creative process in a variety of media.
Click here for course fees.

ART-111. FUNDAMENTALS OF COLOR AND DESIGN
Credits: 3

A basic level design course involving the elements and principles of two-dimensional design and the study of color systems.
Click here for course fees.

ART-113. DRAWING AND COMPOSITION
Credits: 3
Fees:

An introductory course exploring the organization and potential of line, space, and texture through a variety of media and subject matter.
Click here for course fees.

ART-120. PAINTING I
Credits: 3

An introduction to painting methods and materials with an emphasis on composition and basic color theory. Oil, watercolor, and acrylic painting techniques are explored in both realistic and abstract styles.
Click here for course fees.

ART-121. PRINTMAKING
Credits: 3

An introduction to monotype, intaglio and relief printmaking processes. Traditional and creative contemporary approaches to printing original works on paper in a print workshop environment.
Click here for course fees.

ART-122. SCULPTURE
Credits: 3

An introductory to the basic concepts of three-dimensional form and space. Modeling in clay from life; and casting, carving and direct building techniques in plaster among other traditional methods of sculpture will be explored.
Click here for course fees.

ART-123. CERAMICS
Credits: 3

Exploration into the basic methods and techniques of hand building and wheel work. Experimentation in surfaces decoration, glazing, and kiln firing.
Click here for course fees.

ART-134. COMPUTER GRAPHICS I
Credits: 3

A foundation course that introduces the basics of Photoshop, Illustrator, InDesign and Adobe Acrobat, as well as the theory, terminology, and genres of graphic design.
Click here for course fees.

ART-138. DIGITAL PHOTOGRAPHY
Credits: 3
Fees:

An introduction to the fundamentals of photography; camera usage, subject consideration, lighting, digital techniques, and the preparation of photographs for exhibit.
Click here for course fees.

ART-140. HISTORY OF ART I
Credits: 3

A survey of the art and architecture of Western Civilization from pre-history through the Early Renaissance. Non-western cultures will also be introduced. Slide lectures and discussion will focus on major artworks and trends within their cultural setting. ELIGIBLE FOR WOMEN'S STUDIES MINOR.

ART-141. HISTORY OF ART II
Credits: 3

A survey of the art and architecture of Western Civilization from the High Renaissance to the present. Slide lectures and discussions will focus on major artists, artworks, and trends within their cultural setting. ELIGIBLE FOR WOMEN'S STUDIES MINOR.

ART-220. PAINTING II
Credits: 3

Increased emphasis on development of style and experimentation in contemporary art methods and techniques.
Click here for course fees.

Pre-Requisites

[[ART-120]] or permission of instructor.

ART-234. COMPUTER GRAPHICS II
Credits: 3

A continuation of Computer Graphics I designed to reinforce further development in Photoshop, Illustrator, InDesign, and Adobe Acrobat, as well as theory, terminology, and genres of graphic design. Includes the use of media and processes of scanning, collage, typography, and layouts for print.
Click here for course fees.

Pre-Requisites

[[ART-134]] or permission of instructor.

ART-238. DIGITAL PHOTOGRAPHY II
Credits: 3

This course helps students learn the advanced skill necessary to create professional looking images
suitable for commercial use, marketing or for personal enrichment. Upon completion of the course
the student should be able to:

1. Use off camera lighting to create professional looking images of people and still lifes.
2. Realize the importance of professional high quality equipment and be able to
implement them in the production of their images.
3. Fine tune the digital image in post-production and manipulate images using
Photoshop.

Click here for course fees.

Pre-Requisites

[[ART-138]]

ART-241. WOMEN IN ART
Credits: 3

This course will explore the contributions of women artists to the western art tradition from
prehistory to present day, with special emphasis on those from 20th and 21st Century. It begins with
the examination of the socio-cultural condition in which women artists have often been excluded or
marginalized in art history and later emphasizes how issues of gender have been encoded in art
practices, exhibition and collection. Students will read across various fields to interpret and critique
images in art and media to explore women's role and perception, women as audience and the
importance of women as art makers.
Click here for course fees.

ART-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See the Cooperative Education section of this bulletin for placement procedures.)

Pre-Requisites

Sophomore standing, minimum 2.0 cumulative average, consent of academic advisor, and approval of placement by the department chairperson.

BIO. BIOLOGY

BIO-105. THE BIOLOGICAL WORLD
Credits: 3

This course presents concepts and modern ideas pertaining to the natural world and the life sciences. Each semester, a selected topic will be addressed and explored from an investigative set of perspectives. While the scientific method will be emphasized in each offering, the range of topics, identified as a subtitle in the course offering data, will include, for example, 1) Genetics, Evolution, and Ecology: Implications for a Changing Society, 2) Human Biology, 3) Contemporary Issues in the Life Sciences, and others. This course is intended for students who are not majoring in science, engineering, pre-pharmacy, and nursing, or pursuing B.S. programs in mathematics or computer science. Fall semesters: Human Biology—two hours of lecture and two hours of laboratory per week. Dissections of specimens may be required in the laboratory component. Spring semesters: Contemporary Issues in the Life Sciences—three hours of lecture each week.
Click here for course fee.

BIO-113. MICROBIOLOGY
Credits: 4

This course presents the basic principles of bacteriology and the relationship of micro-organisms to disease and its prevention, control, and treatment. It considers the effects of microbes within the body and the body's reaction to them. Lecture, three hours per week; laboratory, three hours per week. Offered every spring semester.
Click here for course fee.

Pre-Requisites

[[BIO-115]] or permission of the instructor.

BIO-115. ANATOMY & PHYSIOLOGY I
Credits: 4
Terms Offered: Fall

This course provides a general study of the human body, its structure and normal function. It provides
an appreciation of the complex nature of the human body with relation to the promotion of a healthy organism. Dissections of specimens are required in the laboratory portion of these courses. Lecture, three hours per week; laboratory, three hours per week.
Click here for course fee.

BIO-116. ANATOMY & PHYSIOLOGY II
Credits: 4
Terms Offered: Spring

This course is a continuation of [[BIO-115]] and provides a general study of the human body, its structure and normal function. It provides an appreciation of the complex nature of the human body with relation to the promotion of a healthy organism. Dissections of specimens are required in the laboratory portion of these courses. Lecture, three hours per week; laboratory, three hours per week.
Click here for course fee.

Pre-Requisites

[[BIO-115]] or permission of instructor.

BIO-121. PRINCIPLES OF MODERN BIOLOGY I
Credits: 4
Terms Offered: Fall

An introduction to concepts of modern biology for students majoring in biology and other sciences. Topics covered include the origin of life, basic biochemistry, cell structure and function, energetics, reproduction and heredity, molecular genetics, and evolution. Four hours of lecture and three hours of laboratory per week. Offered every fall semester. Required of all Biology majors.
Click here for course fee.

Co-Requisites

[[CHM-115]]

BIO-122. PRINCIPLES OF MODERN BIOLOGY II
Credits: 4
Terms Offered: Spring

An introduction to biological diversity and mammalian structure and function for science majors, usually taken as a continuation of [[BIO-121]]. Topics include organismal classification, a survey of biological diversity (including characteristics, ecology, phylogenetic relationships, and economic and biomedical uses) of microbes, plants, and animals, and an overview of the mammalian body addressing the form and function of key organ systems. Dissections of specimens are required in the laboratory portion of this course. Four hours of lecture and three hours of laboratory per week. Offered every spring semester. Required of all Biology majors.
Click here for course fee.

BIO-198. TOPICS
Credits: 1-3

A study of topics of special interest not extensively treated in regularly offered courses.
Click here for course fee.

Pre-Requisites

Will vary according to the specific topics course.

BIO-225. POPULATION AND EVOLUTIONARY BIOLOGY
Credits: 4
Terms Offered: Fall

This course emphasizes the patterns and processes of evolutionary change in living systems in an ecological context. It reviews the basic characteristics and dynamics of populations and the relevance of population ecology and population genetics to the evolution of species. Human evolutions, sociobiology, and other controversial issues are also covered. Laboratory exercises emphasize an experimental approach to more in-depth study of specific topics covered in lecture. Four hours of lecture and three hours of laboratory per week. Offered every fall semester. Required of all Biology majors.
Click here for course fee.

Pre-Requisites

[[BIO-121]] and [[BIO-122]].

BIO-226. CELLULAR AND MOLECULAR BIOLOGY
Credits: 4
Terms Offered: Spring
Fees:

Cell structure in relation to function. Biochemistry and physiology of animal, plant, and bacterial cells and their viruses are presented in a molecular biology context. Cell division and development are examined. Four hours of lecture and three hours of laboratory per week. Offered every spring semester. Required of all Biology majors.
Click here for course fee.

Pre-Requisites

[[BIO-121]] and [[BIO-122]].

BIO-254. SUPERLAB
Credits: 3

Superlab is a research-oriented course in which students carry out laboratory and field-based investigations into research areas such as ecotoxicology, plant physiology, ecology, phylogenetics, molecular biology, and cancer biology. In this course, students have one hour of classroom instruction per week during the regular semester followed by ten days (over a period of two weeks) of intensive laboratory work after the end of the semester. During that second phase of the course, students design and implement experiments and carry out research discussed during the first phase with the aid of their instructors. Offered each year.

Pre-Requisites

[[BIO-225]], [[BIO-226]] or [[BIO-226]] as co-requisite.

BIO-298. TOPICS
Credits: 1-3

A study of topics of special interest not extensively treated in regularly offered courses.
Click here for course fee.

Pre-Requisites

Will vary according to the specific topics course.

BIO-306. INVERTEBRATE BIOLOGY
Credits: 4

This course is a study of the major invertebrate phyla with respect to their taxonomy, evolution, morphology, physiology, and ecology. Three hours of lecture and three hours of laboratory per week. Offered in alternate years.
Click here for course fee.

Pre-Requisites

[[BIO-121]] - [[BIO-122]], [[BIO-225]] - [[BIO-226]], or permission of the instructor.

BIO-311. COMPARATIVE PHYSIOLOGY
Credits: 4

Comparative Physiology encompasses the study of organ functions and organ system functions in different animal groups. Emphasis is on the systemic physiology of vertebrate animals. Three hours of lecture and three hours of laboratory per week. Offered every spring semester. Offered in alternate years.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]]- [[BIO-226]], or permission of the instructor.

BIO-312. PARASITOLOGY
Credits: 4

Parasitology is the study of organisms that live on or within other organisms and the relationship of these organisms to their hosts. This course deals with the common parasites that infect humans and other animals. Three hours of lecture and three hours of laboratory per week. Offered in alternate years.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]]- [[BIO-226]], or permission of the instructor.

BIO-314. COMPARATIVE VERTEBRATE ANATOMY
Credits: 4

This course deals with the evolution and anatomy of the organ systems of vertebrates. Lectures survey the comparative anatomy of the vertebrate classes. Laboratory dissections include the lamprey, shark, mud puppy, and cat in detail. Three hours of lecture and three hours of laboratory per week. Offered in alternate years.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]].

BIO-321. MAMMALIAN PHYSIOLOGY
Credits: 4

This course examines the function of mammalian systems with regard to homeostasis, metabolism, growth and reproduction. Normal physiological processes as well as some pathophysiological situations are covered. While the emphasis is on human physiology, other mammalian systems are discussed to demonstrate physiological adaptability to various environmental situations. Laboratory exercises include physiological experimentation in living systems and in computer simulations. Three hours of lecture and three hours of laboratory per week. Offered in alternate years. This course satisfies the requirement for a course with an emphasis in quantitative biology.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-226]], or permission of the instructor.

BIO-323. FUNCTIONAL HISTOLOGY
Credits: 4

This course emphasizes the microscopic examination of mammalian tissues from morphological and physiological perspectives. Reference is made to organ embryogenesis to support the understanding of organ form and function. Tissue preparation for histological examination is included. Three hours of lecture and three hours of laboratory per week. Offered in alternate years.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]]- [[BIO-226]], or permission of the instructor.

BIO-324. MOLECULAR BIOLOGY
Credits: 4
Terms Offered: Spring

This course introduces students to modern concepts and techniques in molecular biology through a genuine research experience in using cell and molecular biology to learn about a fundamental problem in biology. Rather than following a set series of lectures, we study a problem and see where it leads us. We use the information given in lectures and reading assignments to solve research problems and, in the process, learn a lot of molecular biology. Offered every spring.
Click here for course fee.

Pre-Requisites

[[BIO-225]]- [[BIO-226]], [[CHM-231]]- [[CHM-232]].

BIO-325. ENDOCRINOLOGY
Credits: 4

This course focuses on the structure, biochemistry, and function of mammalian hormones and endocrine glands. Avian, amphibian, and invertebrate hormones are also discussed, where relevant. Clinical pathologies resulting from excess or insufficient hormones are discussed, as this is essential to mastering an understanding of Endocrinology. Laboratory exercises include experimentation in living systems and computer simulations. Three hours of lecture and three hours of laboratory per week. Offered in alternate years.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]]- [[BIO-226]], or permission of instructor.

BIO-326. IMMUNOLOGY AND IMMUNOCHEMISTRY
Credits: 4

This course is concerned with the biological mechanisms and chemistry of reactants and mediators associated with natural and acquired states of immunity, tissue and blood serum responses to infection and immunization. Related pathophysiological alternations of hypersensitivity phenomena in vertebrate animals and man are also discussed. Three hours of lecture and three hours of laboratory per week. Offered in alternate years.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]]- [[BIO-226]], or permission of the instructor.

BIO-327. MEDICAL MICROBIOLOGY
Credits: 4

Medical Microbiology provides a professional level introduction to microbiology that is focused on application of microbiology to the study of infectious disease etiology and epidemiology. The laboratory covers techniques used in isolation and identification of micro-organisms. Three hours of lecture and three hours of laboratory per week. Cross-listed with [[PHA-327]].
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[CHM-231]]- [[CHM-232]].

BIO-328. DEVELOPMENTAL BIOLOGY
Credits: 4

A course dealing with the principles of animal development from descriptive, experimental, and evolutionary perspectives. Laboratory work includes both descriptive and experimental embryology, including molecular techniques. Three hours of lecture and three hours of laboratory per week. Offered in alternate years.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]]- [[BIO-226]], or permission of the instructor.

BIO-329. VIROLOGY
Credits: 3

Virology provides an introduction to the biology of animal viruses. Description of viral molecular architecture and genome organization is followed by a survey of strategies employed for multiplication and regulation of gene expression. Pathogenesis of viral infections is considered from perspectives of viral reproduction strategies and host defense.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]]- [[BIO-226]], [[CHM-231]]- [[CHM-232]], [[CHM-233]]- [[CHM-234]].

BIO-330. INTRODUCTION TO BIOINFORMATICS APPLICATIONS
Credits: 3
Terms Offered: Fall

An introduction to the ways computers are used to make sense of biological information, especially the data generated by the human genome project. Topics covered include databases and data mining, pair-wise, and multiple sequence alignment, molecular phylogeny, finding genes in raw DNA sequences, predicting protein and RNA secondary and tertiary structures, generating and analyzing transcriptomic data, rational drug design, metabolic simulation and artificial intelligence. Offered online every fall, with one assignment each week. This course satisfies the requirement for a course with an emphasis in quantitative biology.

Pre-Requisites

[[BIO-225]]- [[BIO-226]], [[CHM-231]]- [[CHM-232]], [[MTH-150]], or permission of the instructor.

BIO-338. BIOLOGY OF CANCER
Credits: 3

This lecture course is designed to explore the various concepts and mechanisms associated with the origins, elaborations, and future developments in cellular transformation and carcinogenesis. Emphasis is placed on the molecular biology and physiology of these processes; therefore, a solid background in basic biology is required. Oncogenes, tumor suppressor genes, and the disruption of homeostasis are covered in detail, while the medical phenomena typically receive a more general level of coverage.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-226]], [[CHM-231]]- [[CHM-232]].

BIO-340. CONSERVATION BIOLOGY
Credits: 3

This course covers the major topics of conservation biology including an introduction to biodiversity, threats to biodiversity, and solutions to diminish extinctions and population declines. Lecture: three hours per week. Offered each year.

Pre-Requisites

[[BIO-225]]- [[BIO-226]] or permission of the instructor.

BIO-341. FRESHWATER ECOSYSTEMS
Credits: 3

A study of the biological and ecological aspects of streams, lakes, and wetlands from a watershed perspective. An initial introduction to physical, chemical, and geological principles of limnology is followed by a focus on freshwater biology. Laboratories include field-based watershed investigations and lake management assessments using geographic information systems techniques. Two hours of lecture and three hours of laboratory per week. Offered in alternate years. Cross-listed with [[EES-341]].
Click here for course fee.

Pre-Requisites

[[GEO-211]] or [[EES-240]] or [[BIO-121]]- [[BIO-122]] or consent of the instructor.

BIO-342. THE ARCHOSAURS: BIRDS, DINOSAURS, AND CROCODILIANS
Credits: 4

An examination of the biology of the Archosaurs. Major topics include evolutionary history, morphology, physiology, behavior, ecology, and conservation of archosaurs. Laboratory is largely field-based with an emphasis on identifying local fauna and population estimation methods. Laboratory also includes dissection, histology, and a field trip to a museum. Offered in alternate years.

Click here for course fee.

Pre-Requisites

[[BIO-225]] or permission of the instructor.

BIO-343. MARINE ECOLOGY
Credits: 3

An examination of the biology of marine life within the context of modern ecological principles. The structure and physiology of marine organisms are studied from the perspectives of adaptation to the ocean as habitat, biological productivity, and interspecific relationships. Emphasis is placed on life in intertidal zones, estuaries, surface waters, and the deep sea. Two hours of lecture and three hours of laboratory per week. Offered in alternate years. Cross-listed with [[EES-343]].
Click here for course fee.

Pre-Requisites

[[EES-230]] and [[BIO-121]]- [[BIO-122]]. Students must have formal course experiences in oceanography and biology at the science major level or have completed their sophomore year as a biology major.

BIO-344. ECOLOGY
Credits: 4

An examination of contemporary ecological thinking as it pertains to the interrelationships of organisms and their environments. Interactions at the population and community level are emphasized. Three hours of lecture and three hours of laboratory per week. Offered in alternate years. Cross-listed with [[EES-344]]. This course satisfies the requirement for a course with an emphasis in quantitative biology.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]] or permission of the instructor

BIO-345. GENETICS
Credits: 4

This course presents a detailed treatment of genetics beyond the introductory level in the areas of both transmission and molecular genetics. It includes discussion of the role of genetics in such areas as developmental medicine. Three hours of lecture and three hours of lab per week. Offered every fall semester.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]]- [[BIO-226]], or permission of the instructor.

BIO-346. ANIMAL BEHAVIOR
Credits: 4

A course emphasizing behavior as the response of animals to physical and social environmental change. It covers the processes that determine when changes in behavior occur and what form the changes take. Laboratories, using local fauna, demonstrate principles discussed in lecture. Three hours of lecture and three hours of laboratory per week. Offered in alternate years. This course satisfies the requirement for a course with an emphasis in quantitative biology.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]]- [[BIO-226]], or permission of the instructor.

BIO-347. BIOSTATISTICS AND EXPERIMENTAL DESIGN
Credits: 4

This course reviews the statistical paradigms and techniques involved in analyzing biological phenomena. Frequentist and Bayesian methods are employed when appropriate with an emphasis on applied statistics and experimental design. Laboratory exercises include designing, analyzing, and communicating experiments. Computation and computer coding is employed in laboratory exercises. Offered in alternate years.
Click here for course fee.

Pre-Requisites

[[BIO-225]], [[MTH-150]], or permission of the instructor.

BIO-348. FIELD ZOOLOGY
Credits: 3

The goals of this summer course are to introduce field methods of zoology and increase familiarity with Pennsylvania's animals. Taxa covered include turtles, snakes, birds, fish, arthropods, and mammals. Topics covered include conservation issues, population estimation, and sampling methods. Time distributed between lecture, lab, and fieldwork. Offered annually.
Click here for course fee.

Pre-Requisites

[[BIO-225]]- [[BIO-226]] or permission of the instructor.

BIO-352. PATHOPHYSIOLOGY
Credits: 4

Pathophysiology provides a series of lectures, exercises, and problem-solving sessions integrating the concepts of functional anatomy with human disease. Problem-based learning is encouraged by reviewing illustrative clinical cases and using interactive audio-visual media. Offered in alternate years.
Click here for course fee.

Pre-Requisites

[[BIO-225]]- [[BIO-226]] or permission of the instructor.

BIO-361. PLANT FORM AND FUNCTION
Credits: 4

An introduction to the morphology, anatomy, cytology, and physiology of vascular plants. Structural and functional aspects of plants are interpreted in relation to each other and within ecological and evolutionary contexts. Offered in a workshop format of two three-hour sessions per week. Offered every other fall semester.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]]- [[BIO-226]], or permission of the instructor.

BIO-362. PLANT DIVERSITY
Credits: 4

A comprehensive survey of algae, bryophytes, and vascular plants emphasizing their structure, reproductive biology, natural history, evolution, and importance to humans. Offered in a workshop format of two three-hour sessions per week. Offered every other fall semester.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]]- [[BIO-226]], or permission of the instructor.

BIO-363. HEMP BIOLOGY AND ANALYSIS
Credits: 4

This course is an introduction to hemp biology and analysis. Topics include an overview of hemp, hemp phylogeny, subspecies, plant structure, development, reproduction, water uptake, transport, uses for hemp, hemp pathogens and pests, and ways to improve hemp production using biotechnology.
Click here for course fee.

Pre-Requisites

Sophomore or pharmacy P-1 standing or instructor permission.

BIO-366. FIELD BOTANY
Credits: 3

A specialized summertime field course that emphasizes a taxonomic, phylogenetic, and ecological survey of vascular plants indigenous to Northeastern Pennsylvania. Course includes field trips to a diverse array of habitats in Northeastern Pennsylvania. Cross-listed with [[EES-366]]. Offered in alternate years.
Click here for course fee.

Pre-Requisites

[[BIO-121]]- [[BIO-122]] or permission of the instructor.

BIO-368. MEDICAL BOTANY
Credits: 3

A specialized summertime course that provides a scientifically based overview of the ways in which plants affect human health. Topics include cultural and historical perspectives of plants and medicine, plants that cause human ailments, plants used to treat human ailments, and psychoactive plants. Two hours of lecture per day for five weeks. Offered in alternate years.

Pre-Requisites

[[BIO-121]]- [[BIO-122]], [[BIO-225]], [[CHM-231]]- [[CHM-232]], or permission of the instructor.

BIO-369. PLANT PHYSIOLOGY
Credits: 4

This course introduces students to modern concepts and techniques in plant physiology through a genuine research experience using the techniques of plant physiology to learn about a problem in plant biology. Rather than following a set series of lectures, we study a problem and see where it leads us. We use the information given in lectures and reading assignments to solve research problems and, in the process, learn a lot of plant physiology. Offered in alternate years.
Click here for course fee.

Pre-Requisites

[[BIO-225]]- [[BIO-226]], [[CHM-231]]- [[CHM-232]], or permission of the instructor.

BIO-391. SENIOR RESEARCH I
Credits: 1
Terms Offered: Fall

The student pursues independent research as a member of a team of senior biology majors. Each team is responsible for the identification of an original research problem, a thorough literature review of the problem, a detailed prospectus prepared in the format of a grant proposal, and formal oral presentations. Senior research is required of all biology majors seeking a four-year degree in Biology. Open only to senior Biology majors.

Click here for course fee.

Pre-Requisites

Biology major senior standing

BIO-392. SENIOR RESEARCH II
Credits: 2
Terms Offered: Spring

A continuation of [[BIO-391]]. The student pursues independent research as a member of a team of senior biology majors. Each team is responsible for the execution of their research project, a formal oral presentation, a poster, and a final manuscript prepared in standard journal format. Senior research is required of all biology majors seeking a four-year degree in Biology. Open only to senior Biology majors, or with permission of instructor.

Click here for course fee.

Pre-Requisites

Biology major senior standing, or with permission of instructor.

BIO-394. BIOLOGICAL FIELD STUDY
Credits: 1-3

Pre-Requisites

[[BIO-121]]- [[BIO-122]] or permission of the instructor.

BIO-395. INDEPENDENT RESEARCH
Credits: 1-3

This course involves independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required; it must also be presented orally at an appropriate off-campus science meeting.

Requirements:
Written approval of the department chairperson is required. Candidates for Independent Research must have a minimum GPA of 3.00 and be of upper class standing.

BIO-396. INDEPENDENT RESEARCH
Credits: 1-3

This course involves independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper at a level significantly beyond a term paper is required; it must also be presented orally at an appropriate off-campus science meeting.

Requirements:
Written approval of the department chairperson is required. Candidates for Independent Research must have a minimum GPA of 3.00 and be of upper class standing.

BIO-397. PROFESSIONAL PREPARATION TECHNIQUES
Credits: 2

Professional Preparation Techniques introduces Biology majors to Biology as a profession. Students learn how to read, write, and analyze research papers and how to make oral presentations and posters using electronic and paper-based supplements. Career development issues, including effective presentation of credentials, are also addressed. Offered every fall and every spring semester.

Pre-Requisites

Junior-level standing, or permission of the instructor.

BIO-398. TOPICS
Credits: 1-3

A study of topics of special interest not extensively treated in regularly offered courses.
Click here for course fee.

Pre-Requisites

Will vary according to the specific topics course.

BIO-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. See the Cooperative Education section of this bulletin for placement procedures. Requirements: Sophomore standing, 2.0 minimum cumulative GPA, consent of the academic advisor, and approval of placement by the department chairperson.

BA. BUSINESS ADMINISTRATION

BA-119. DATA ANALYSIS IN EXCEL
Credits: 1

This course is designed to teach the basic and advanced features and functions of Excel, including summative, descriptive and reporting techniques. Students will also gain the knowledge of data manipulation and visual reporting. This one-credit class will meet multiple times each week, and will run for 5 consecutive weeks.

BA-151. INTEGRATED MANAGEMENT EXPERIENCE I
Credits: 3
Terms Offered: Fall

Integrated Management Experience is a two-semester sequence that takes you through the entrepreneurial process from creating a business concept to planning the venture to launching and operating the business to harvest and closure of the firm. You learn how businesses plan and operate through the study of functional areas such as marketing, management, human resources, accounting and finance, and operations. Most importantly, you will learn and experience how the pieces fit together through integrating the functional areas tracking information and performance using financial accounting principles. Cross listed with [[ACC-151]] and [[ENT-151]].

BA-152. INTEGRATED MANAGEMENT EXPERIENCE II
Credits: 3
Terms Offered: Spring

Integrated Management Experience is a two-semester sequence that takes you through the entrepreneurial process from creating a business concept to planning the venture to launching and operating the business to harvest and closure of the firm. You learn how businesses plan and operate through the study of functional areas such as marketing, management, human resources, accounting and finance, and operations. You develop a clear understanding of the importance of accounting cycles and how financial accounting principles provide not only information but an integrating thread for all types of organizations. Cross listed with [[ACC-152]] and [[ENT-152]].

Pre-Requisites

[[ACC-151]] / [[BA-151]] / [[ENT-151]] with a minimum grade of 2.0

BA-153. MANAGEMENT FOUNDATIONS
Credits: 3

Management Foundations provides the framework for further study in accounting, business administration, and entrepreneurship programs. Functional areas of management are examined. This class is closed to freshmen and to any student who completed ACC/BA/ENT 151 and ACC/BA/ENT 152.

BA-319. BUSINESS STATISTICS
Credits: 3
Terms Offered: Fall

An introduction to the primary tools of research in business and economics; the collection, summarization, analysis, and interpretation of statistical findings relevant to business decisions. Two hours of lecture and one hour of individualized laboratory. Topics covered will include, but not be limited to, descriptive statistics, probability, sampling theory, hypothesis testing, and regression and correlation analysis. Cross-listed with [[EC-319]]

Pre-Requisites

[[MTH-101]] or higher

BA-335. LAW AND BUSINESS
Credits: 3

This course provides a foundation for understanding how the law functions; the laws protecting consumers and employees; and the law of contracts, sales, and business organizations.

BA-336. ADVANCED TOPICS IN BUSINESS LAW
Credits: 3
Terms Offered: Spring

This course provides students with an understanding of select advanced topics in law, specifically those that have the greatest impact on business and accounting.

Pre-Requisites

[[BA-335]] with a minimum grade of 2.0

BA-337. LEGAL ASPECTS OF SPORT AND EVENT MANAGEMENT
Credits: 3

Introduces legal issues that confront contemporary organized athletics and sports management. Specific topics which are highlighted include impact of antitrust laws; personal services contracts; labor law; injury and liability; franchise and transfer rules; and tax aspects. Examines the role of legal services within sports organizations and in individual athlete representation.

Pre-Requisites

[[BA-335]] with a minimum grade of 2.0

BA-338. INTERNATIONAL BUSINESS LAW
Credits: 3
Terms Offered: On Demand,Spring

The course will focus on international business law applicable to international business transactions. Topics covered will include comparable legal systems in the world and the law relative to 1) international sales, transport, credit and commercial agreements; 2) trade law including imports, customs, tariff regulations/agreements, regional free trade areas; 3) regulation of the marketplace including licensing, patent, advertising, sales representation, foreign investment and business formation, currency risk, anti-trust, employment and environmental law. This course is offered every other fall – odd years.

Pre-Requisites

[[BA-335]] with a minimum grade of 2.0

BA-419. QUANTITATIVE DECISION MAKING
Credits: 3

This course is designed to build on the basics of introductory statistics so that the students understand how a variety of advanced statistical tools are used to support decision-making using business data. Students develop necessary skills to build models that conform the assumptions of the procedures. The course aims to provide more hands on experience. The topics that will be introduced include descriptive statistics, t-tests, ANOVA, simple linear regression, multiple linear regression, logistic regression and their applications on business data.

Pre-Requisites

[[BA-319]] or [[MTH-150]]

BA-461. BUSINESS STRATEGY AND DECISION-MAKING
Credits: 3

The first of a two-semester capstone experience. This course integrates the functional areas of business from the perspective of top management. Emphasis is on the role of management in the formation of strategic and long-range plans.

Pre-Requisites

[[MKT-221]], [[EC-101]], [[EC-102]], [[FIN-240]], and [[MGT-251]] all with a minimum grade of 2.0

BA-462. PROFESSIONAL BUSINESS EXPERIENCE
Credits: 3

This internship course consists of professional business experience in which students apply their accumulated knowledge, skills and abilities in an organization related to the student's academic objectives and career goals. This course requires Cooperative Education approval as well as the approval of the academic advisor, the department chair and the faculty advisor for the course.

Pre-Requisites

[[MKT-221]], [[FIN-240]], and [[MGT-251]] all with a minimum grade of 2.0

BA-463. THE BUSINESS FIELD AND RESEARCH EXPERIENCE
Credits: 3

This course allows the student to choose from a variety of professional opportunities. The student could perform research and writing in his or her major area. Such research must be approved by the instructor in advance. (The Undergraduate Thesis) The student may participate in a multidisciplinary capstone course that incorporates the application of business creation, development, and planning. It includes the application of business functions such as management, business strategy, marketing, accounting, finance, operations management, and sales. (The Business Incubator) The student could also visit several local organizations to conduct a live case comparison that spans industries and organizations as it pertains to his or her major area and faculty interests. (The Business Field Experience) Action learning gives students the opportunity to develop an understanding of the Sidhu School disciplines and business practices that are ethically and socially responsible.

Pre-Requisites

Senior class standing.

BA-464. INTERNATIONAL BUSINESS EXPERIENCE
Credits: 3

The course provides an overview of a Western European Society. A ten-day field trip in Western Europe is a major learning experience of the course. Site visits are made in a number of cities in European countries. Site visits include Cities, Regions, and Business and travel centers. Arrangements for travel are made during the fall, and travel in the spring. The purpose of the course is to create a global learning experience using Western Europe as a medium to facilitate the student's understanding of the global business environment. Presentations, discussions, travel, observations, projects, as well as written papers will provide students with the opportunity to demonstrate their understanding and knowledge.

CAR. CAREERS

CAR-101. LIFE/CAREER PLANNING
Credits: 1

A study of the components of career decision-making, including the influence of personal goals, values, interests, and perceived skills. The practical application of theory results in a portfolio of information essential to deliberate and effective decision-making.

CAR-398. CAREER SUCCESS PLANNING
Credits: 1

A course for junior and senior undergraduates, focusing on the skills and written materials required for successful professional employment or graduate school searches, applications and interviews.

CHM. CHEMISTRY

CHM-105. CHEMISTRY AND MODERN SOCIETY
Credits: 3

This course will emphasize consumer applications of chemistry with some emphasis on environmental consequences of the use of various forms of energy (nuclear, coal, petroleum, natural gas) and everyday chemicals (foods, drugs, agricultural chemicals, and chemicals used in pest control).

CHM-111. FUNDAMENTALS OF CHEMISTRY
Credits: 4

Designed for students who do not intend to major in science or engineering, this one-semester course presents principles of chemistry. Topics include atomic structure, chemical bonding, gas laws, solutions, acid/base chemistry and an introduction to organic and biochemistry. A laboratory component is required as part of this course, in which students will develop basic principles of laboratory technique. Students may not receive credit for both CHM 111 and CHM 113/115. Three hours of class, one hour of problem session, and two hours of lab per week.
Click here for course fee.

Pre-Requisites

Departmental placement criteria are met.

CHM-113. ELEMENTS AND COMPOUNDS LAB
Credits: 1

This is the first chemistry laboratory course in the two-semester general chemistry sequence. Experiments are performed to reinforce the concepts learned in CHM-115. One three-hour laboratory per week.
Click here for course fee.

Pre-Requisites

Departmental placement criteria are met

Co-Requisites

[[CHM-115]]

CHM-114. THE CHEMICAL REACTION LAB
Credits: 1

This is the second chemistry laboratory course in the two-semester general chemistry sequence. Experiments are performed to reinforce the concepts learned in CHM-116. One three-hour laboratory per week.

Click here for course fee.

Pre-Requisites

[[CHM-113]] with a grade of 2.0 or better and [[CHM-115]] with a grade of 2.0 or better

Co-Requisites

[[CHM-116]]

CHM-115. ELEMENTS AND COMPOUNDS
Credits: 3

Emphasis is placed on the periodic table and stoichiometry, including chemical properties, physical states, and structure. Three hours of class and a one-hour problem session per week.
Corequisite: [[CHM-113]].

Pre-Requisites

Departmental placement criteria are met.

CHM-116. THE CHEMICAL REACTION
Credits: 3

A detailed study of chemical equilibria in aqueous solution. Three hours of class and a one-hour problem session per week.

Pre-Requisites

[[CHM-113]] with a grade of 2.0 or better and [[CHM-115]] with a grade of 2.0 or better

Co-Requisites

[[CHM-114]]

CHM-117. INTRODUCTORY CHEMISTRY LAB FOR ENGINEERS
Credits: 1

This is a one-semester introductory chemistry laboratory course for engineering students. Experiments are performed to reinforce the concepts learned in [[CHM-118]]. One three-hour lab per week.
Click here for course fee.

Pre-Requisites

Departmental placement criteria are met.

Co-Requisites

[[CHM-118]]

CHM-118. CHEMISTRY FOR ENGINEERS
Credits: 3

This course covers the foundations of chemistry, matter and measurements, periodicity, atomic and molecular structure, stoichiometry, states of matter, phase changes, kinetics, equilibrium, thermochemistry and electrochemistry. Four hours of lecture per week.

Pre-Requisites

Departmental placement criteria are met

Co-Requisites

[[CHM-117]]

CHM-190. FRESHMEN SEMINAR
Credits: 1
Terms Offered: Spring

Students will be introduced to important skills and content area in our major programs. Students will gain familiarity with the various subdisciplines of chemistry, tools & technologies utilized by chemists, potential career pathways and applications of chemistry in everyday settings. Students will also discuss chemistry and its subdisciplines in the news and modern society.

Pre-Requisites

Successful completion of [[CHM-115]] / [[CHM-113]] with grades of 2.00 or higher or instructor permission.

Co-Requisites

[[CHM-116]] / [[CHM-114]] or instructor permission.

CHM-231. ORGANIC CHEMISTRY I
Credits: 3
Terms Offered: Summer

An introduction to the chemistry of carbon compounds, this course develops the interconnected relationship between bonding, structure, properties and reactivity in organic compounds. Instrumental methods will be presented as a means to determine structure. Three hours of class and a one-hour problem session per week.

Pre-Requisites

[[CHM-114]] with a grade of 2.0 or better and [[CHM-116]] with a grade of 2.0 or better

Co-Requisites

[[CHM-233]]

CHM-232. ORGANIC CHEMISTRY II
Credits: 3

This course continues [[CHM-231]], with emphasis on organic synthesis. Three hours of class and a one-hour problem session per week.

Pre-Requisites

[[CHM-231]] with a grade of 2.0 or better and [[CHM-233]] with a grade of 2.0 or better

Co-Requisites

[[CHM-234]]

CHM-233. ORGANIC CHEMISTRY I LAB
Credits: 1

After an introduction to standard organic reaction, purification, physical characterization, and spectroscopic techniques, students will investigate concepts discussed in [[CHM-231]]. One three-hour laboratory per week.
Click here for course fee.

Pre-Requisites

[[CHM-114]] with a grade of 2.0 or better and [[CHM-116]] with a grade of 2.0 or better

Co-Requisites

[[CHM-231]]

CHM-234. ORGANIC CHEMISTRY II LAB
Credits: 1

Weekly labs that parallel the lecture topics in [[CHM-232]] and emphasize organic synthesis and characterization, including multistep synthesis. Three hours per week.
Click here for course fee.

Pre-Requisites

[[CHM-231]] with a grade of 2.0 or better and [[CHM-233]] with a grade of 2.0 or better

Co-Requisites

[[CHM-232]]

CHM-235. ESSENTIALS OF ORGANIC CHEMISTRY
Credits: 3

A one semester course covering the fundamentals of carbon chemistry. Nomenclature, stereochemistry, functional groups, spectroscopy, and reactions and mechanisms of alcohols, ethers, amines, alkyl halides, carbonyl compounds, and benzene are covered. Four hours of lecture per week.

Pre-Requisites

[[CHM-114]] with a grade of 2.0 or better and [[CHM-116]] with a grade of 2.0 or better.

Co-Requisites

[[CHM-237]]

CHM-237. ESSENTIALS OF ORGANIC CHEMISTRY LAB
Credits: 1

A one semester fundamental organic chemistry laboratory course that introduces organic reactions, purification, physical characterization and spectroscopic techniques.

Click here for course fee.

Pre-Requisites

[[CHM-114]] with a grade of 2.0 or better and [[CHM-116]] with a grade of 2.0 or better.

Co-Requisites

[[CHM-235]]

CHM-246. ANALYTICAL CHEMISTRY LAB
Credits: 1

Weekly labs that parallel the lecture topics in [[CHM-248]]. One three-hour laboratory per week.

Click here for course fee.

Pre-Requisites

[[CHM-114]] with a grade of 2.0 or better and [[CHM-116]] with a grade of 2.0 or better

Co-Requisites

[[CHM-248]]

CHM-248. ANALYTICAL CHEMISTRY
Credits: 3

A course in the application of the principles of chemical equilibria to obtain the qualitative and quantitative information about the composition and structure of matter. An introduction to the importance of sampling is included along with methods for the statistical treatment of data. The course focuses primarily on the analyses of elemental and ionic species using electrochemical, spectroscopic, and chromatographic techniques. Three hours of lecture per week.

Pre-Requisites

[[CHM-114]] with a grade of 2.0 or better and [[CHM-116]] with a grade of 2.0 or better

Co-Requisites

[[CHM-246]]

CHM-256. POLYMER CHEMISTRY
Credits: 3

This course covers topics in polymer composition and structure, polymerization mechanisms, stereochemistry of polymerization and reaction of polymers. Three hours of lecture per week.

Pre-Requisites

[[CHM-117]] with a grade of 2.0 or better and [[CHM-118]] with a grade of 2.0 or better

CHM-258. POLYMER CHEMISTRY LABORATORY
Credits: 1

Experiments are conducted to emphasize the concepts learned in the Polymer Chemistry lecture course, [[CHM-256]]. Students will collect and process experimental data and develop laboratory skills. One three-hour laboratory per week.

Click here for course fee.

Pre-Requisites

[[CHM-117]], [[CHM-118]]

Co-Requisites

[[CHM-256]]

CHM-261. PLANT SAMPLE PREPARATION FOR CHEMICAL ANALYSIS
Credits: 2

This is course in plant preparation for analytical chemical analysis, covering plant dehydration, digestion, and extraction of pertinent organic and inorganic chemical analytes for analysis on modern chemical instrumentation. One (1.0) hour per week of lecture/discussion and three (3.0) hours per week of laboratory.

Click here for course fee.

Pre-Requisites

[[CHM-231]] or instructor permission.

Co-Requisites

[[CHM-231]] or instructor permission.

CHM-291. ETHICAL RESPONSIBILITIES IN MODERN SCIENCE
Credits: 1
Terms Offered: Spring

Students will become familiar with ethical issues facing modern scientists, their role in maintaining an ethical environment, and learn to behave in an ethical fashion when conducting research as an undergraduate and moving forward. Students will also evaluate the role of scientists in society, and their responsibility to ensure the proper dissemination of scientific knowledge. Topics include: what is misconduct, roles in a lab setting and how they affect power dynamics, scientific communication, data ownership, human subjects and the IRB, and the societal responsibilities of scientists. Assignments will be tailored to the major program (including: biochemistry, cannabis chemistry, and other specific chemistry tracks) of the registered students.

Pre-Requisites

30 (or more) credits completed

CHM-322. INORGANIC CHEMISTRY
Credits: 3

[[CHM-322]] presents a survey of current topics in Inorganic Chemistry. The first half of the course offers a survey of main group chemistry, including individual group trends. The second half of the course covers Crystal Field Theory, Ligand Field Theory, reaction mechanisms, and organometallic compounds. Three hours of lecture per week.

Pre-Requisites

[[CHM-114]] with a grade of 2.0 or better & [[CHM-116]] with a grade of 2.0 or better

CHM-323. ADVANCED INORGANIC CHEMISTRYLAB
Credits: 1

Advanced Inorganic Chemistry Laboratory is the complimentary laboratory to CHM-322 Inorganic Chemistry. Students will build upon the foundational concepts first explored in CHM-322. An emphasis will be placed on the synthesis and characterization of transition metal complexes. Coordination chemistry reactions and mechanisms will be introduced as well as the chemistry of lanthanides. Students will gain experience in the handling of air-sensitive materials. Laboratory, three hours per week.

Click here for course fee.

Pre-Requisites

[[CHM-322]]

CHM-341. INSTRUMENTAL METHODS FOR CHEMICAL ANALYSIS
Credits: 3

A course in the fundamental principles that provide the basis for the design and fabrication of chemical instrumentation. The underlying physical basis for each method is introduced through an exploration of the capabilities, limitations, and applications of a wide range of separations, spectroscopic, and electrochemical methods. Three hours of lecture per week.

Pre-Requisites

[[CHM-246]] with a grade of 2.0 or better, [[CHM-248]] with a grade of 2.0 or better, [[MTH-112]], [[PHY-202]]

Co-Requisites

[[CHM-343]]

CHM-343. INSTRUMENTAL METHODS FOR CHEMICAL ANALYSIS LAB
Credits: 1

Weekly lab that corresponds to the lecture topics in [[CHM-341]]. One three-hour laboratory per week.
Click here for course fee.

Co-Requisites

[[CHM-341]]

CHM-346. ADVANCED SEPARATIONS CHEMISTRY
Credits: 2
Terms Offered: Spring

An analytical chemistry laboratory course in separations chemistry. The course will cover chromatography, including GC-MS, LC, and LC-MS with a focus on their application to cannabis and natural products analysis. The course will also cover the operation and maintenance of the modern chemical chromatography instrumentation. Meets for two-laboratory sessions per week.

Click here for course fee.

Pre-Requisites

[[CHM-341]] , [[CHM-343]] and [[CHM-261]] or instructor permission.

CHM-351. PHYSICAL CHEMISTRY: QUANTUM AND SPECTROSCOPY
Credits: 3

This course emphasizes the molecular approach to physical chemistry. It begins discussing the principles of quantum mechanics and their applications in chemistry, leading to atomic and molecular structure, and chemical bonding. These concepts are then used in the development of atomic and molecular spectroscopy. Photochemistry is introduced. Three hours of lecture per week.

Pre-Requisites

[[CHM-114]] with a grade of 2.0 or better, [[CHM-116]] with a grade of 2.0 or better, [[MTH-212]] and [[PHY-202]]

CHM-352. PHYSICAL CHEMISTRY: KINETICS AND THERMODYNAMICS
Credits: 3

Statistical mechanics is used to formulate thermodynamics in terms of atomic and molecular properties, allowing a molecular interpretation of the laws of thermodynamics. Three hours of lecture a week.

Pre-Requisites

[[CHM-114]] with a grade of 2.0 or better, [[CHM-116]] with a grade of 2.0 or better, [[MTH-212]], and [[PHY-202]]

CHM-353. PHYSICAL CHEMISTRY: QUANTUM AND SPECTROSCOPY LAB
Credits: 1

Laboratory experiments are performed in order to reinforce concepts in [[CHM-351]]. Bench as well as computational experiments will explore the photoelectric effect, resonance states of a particle in a one-dimensional box, applications of molecular orbital theory, and molecular spectroscopy. Three hours per week.
Click here for course fee.

Co-Requisites

[[CHM-351]]

CHM-354. PHYSICAL CHEMISTRY: KINETICS AND THERMODYNAMICS LAB
Credits: 1

Laboratory experiments are performed in order to reinforce concepts in [[CHM-352]]. Bench as well as computational experiments explore calorimetry, phase equilibria, colligative properties, kinetics, and applications of the Monte Carlo method to chemical kinetics. One three-hour lab per week.

Co-Requisites

[[CHM-352]]

CHM-355. PHYSICAL CHEMISTRY FOR LIFE SCIENCES
Credits: 4

An introduction to traditional physical chemistry topics, including additional topics related to life sciences. Laws of thermodynamics, equilibria, kinetics, and spectroscopy will be discussed in terms of their application to life sciences. Four hours of lecture per week.

Pre-Requisites

[[CHM-114]] with a grade of 2.0 or better, [[CHM-116]] with a grade of 2.0 or better, and [[PHY-202]]

Co-Requisites

[[CHM-357]]

CHM-357. PHYSICAL CHEMISTRY FOR LIFE SCIENCES LAB
Credits: 1

The laboratory experiments emphasize concepts presented in [[CHM-355]]. Course includes experimental work, analysis of a research article, and computer simulations relevant to life sciences. One three-hour laboratory pre week.

Co-Requisites

[[CHM-355]]

CHM-361. BIOCHEMISTRY: STRUCTURE AND FUNCTION
Credits: 3

This course presents a study of the physical and chemical properties of proteins, nucleic acid, fatty acids, and carbohydrates, emphasizing the relationship between the chemical structure and the biological function. The course includes the physical methods of biochemistry, enzyme kinetics, bioenergetics, and nucleic acid transcription and translation. Three hours of lecture per week.

Pre-Requisites

[[CHM-232]] with a grade of 2.0 or better

CHM-362. BIOCHEMISTRY: METABOLISM
Credits: 3

This course presents a study of the catabolism and anabolism of carbohydrates, fatty acids, and amino acids. The course emphasizes the regulation and integration of major metabolic pathways, including glycolysis, the Krebs cycle, electron transport, gluconeogenesis, pentose phosphate pathway, fatty acid metabolism, and amino acid metabolism. Three hours of lecture per week.

Pre-Requisites

[[CHM-232]] with a grade of 2.0 or better

CHM-363. BIOCHEMISTRY LABORATORY
Credits: 1

Laboratory experiments, which emphasize biochemical techniques used in isolation and characterization of macromolecules. Included in the course are various chromatographic techniques, electrophoresis, spectrophotometry, and classic biochemical methods. Laboratory, three hours a week.

Click here for course fee.

Pre-Requisites

Prerequisite or Corequisite: [[CHM-361]] or permission of instructor.

CHM-365. MEDICAL BIOCHEMISTRY
Credits: 4

Introduction to basic biochemistry concepts, focusing on the structure and function of vitamins, proteins, and lipids, as well as bioenergetics and major catabolic pathways. The catabolism of carbohydrates, fats and amino acids, including reactions and regulation, will be discussed. Common metabolic pathways of drugs, enzyme induction and metabolism down regulation will also be presented. Four hours of lecture per week. Cross-listed with [[PHA-365]] and [[BEGR-465]].

Pre-Requisites

[[CHM-232]] or [[CHM-235]] with a grade of 2.0 or better, or permission of the instructor

CHM-370. CHM 371,CHM 372 INTEGRATED LABORATORIES I, II, III
Credits: 1-2 each

Laboratory experiments related to the five major areas of chemistry. Labs will be chosen in order that students might demonstrate proficiency in each of the required areas. Labs will include synthesis, isolation, and characterization of chemical compounds, spectroscopy, kinetics, calorimetry, chromatography, electrophoresis, and other chemical and biochemical methods. Three hours of laboratory per week per credit hour.

Click here for course fee.

Pre-Requisites

[[CHM-232]] with a grade of 2.0 or better, [[CHM-234]] with a grade of 2.0 or better and [[CHM-341]] with a grade of 2.0 or better

CHM-377. INTRODUCTION TO TOXICOLOGY
Credits: 3
Terms Offered: Fall

An introduction to toxicology, including its history, types of poisons, their mode of operation and the biochemistry of detoxification. Environmental problems caused by toxic contaminants will be discussed.
This course is offered in the fall semester of even numbered years.

Pre-Requisites

[[CHM-232]] , [[CHM-234]] and [[BIO-226]] or instructor permission.

CHM-379. MEDICINAL CHEMISTRY
Credits: 3
Terms Offered: Fall

The course provides an introduction to drugs, their action and discovery. Topics covered include drug structure & solubility, structure-activity & quantitative structure relationships, drugs from natural sources, the role of biological membranes in drug delivery, the role of receptors & messengers, enzymes, and an introduction to drug and analogue synthesis.
This course is offered in the fall semester of odd numbered years.

Pre-Requisites

[[CHM-232]] , [[CHM-234]] and [[BIO-226]] or instructor permission.

CHM-380. NMR SPECTROSCOPY
Credits: 3

This course explores the capabilities of the Chemistry Department's NMR spectrometer, and provides a groundwork in NMR theory beyond the level covered in the sophomore organic course. Topics covered include hardware, data processing, chemical shifts and coupling, one- and two-dimensional pulse sequences, dynamic NMR, the NOE effect, and gradient methods. Offered in alternate years.

CHM-390. JUNIOR SEMINAR
Credits: 1

CHM-390 is a one-hour course offered during the spring semester. It is designed to prepare chemistry and biochemistry majors for their careers after graduation and for their capstone research projects, undertaken in the fourth year. The course will cover topics such as résumé preparation, communication of scientific information, internships, job searches, and preparation for graduate school. Students will prepare a topical literature review on their chosen project in conjunction with their selection of a research advisor.

Pre-Requisites

45 hours of service to the Chemistry Department. Requirements; Junior standing and declared major in Chemistry or Biochemistry.

CHM-391. SENIOR RESEARCH I
Credits: 2

Students will plan and execute a chemistry research project under the direction of a faculty member. It is expected that this will be a laboratory research project. Students will also learn how to search the chemical literature. Students are required to attend weekly Department seminars and present at least one seminar. Requirements: Senior standing in a Chemistry curriculum.

Click here for course fee.

Pre-Requisites

[[CHM-352]] with a grade of 2.0 or better or [[CHM-355]] with a grade of 2.0 or better

CHM-392. SENIOR RESEARCH II
Credits: 2

Students will carry out a chemistry research project under the direction of a faculty member. It is expected that the project will be a laboratory research project. The project must culminate in a written report and the results must be presented at a Department poster event. Students are also required to attend any seminars hosted by the Department. Six hours of laboratory / research work per week.

Click here for course fee.

Pre-Requisites

[[CHM-391]] with a grade of 2.0 or better

CHM-395. INDEPENDENT RESEARCH
Credits: 1-3

Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper is required.

Requirements: permission of the instructor.
Click here for course fee.

CHM-396. INDEPENDENT RESEARCH
Credits: 1-3

Independent study and research for advanced students in the field of the major under the direction of a staff member. A research paper is required.

Requirements: permission of the instructor.
Click here for course fee.

CHM-398. TOPICS
Credits: 1-3

A study of topics of special interest, such as advanced physical chemistry, advanced analytical chemistry, advanced organic chemistry, surface and colloid chemistry, nuclear chemistry, chemical kinetics, polymer chemistry, or spectroscopy.

Pre-Requisites

Will vary according to the specific topics course.

CHM-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. See the Cooperative Education section of this bulletin for placement procedures.Requirements: Sophomore standing; minimum 2.0 cumulative GPA; consent of the academic advisor; and approval of placement by the department chairperson. Students without the indicated prerequisites for 200 and 300-level chemistry courses may enroll after written permission of the instructor has been approved by the department chair.

CE. CIVIL ENGINEERING

CE-231. SOIL MECHANICS
Credits: 3

Develops the terminology and descriptions common to soil compressibility, fluid flow, response to mechanical compaction, and strength as well as methods of determining geostatic stresses and stress changes due to boundary loadings.

Pre-Requisites

[[ME-232]]
[[ME-234]]

CE-233. SOIL MECHANICS LAB
Credits: 1

Experiments with and analysis of basic soil mechanics. Three hours of laboratory per week.

Click here for course fees.

Pre-Requisites

[[ME-232]]
[[ME-234]]

Co-Requisites

[[CE-231]]

CE-261. CONSTRUCTION PROJECT MANAGEMENT
Credits: 2

This course will introduce students to the basics of construction scheduling, resource allocation in schedules, and schedule monitoring and control methods. Introduction to regulations and permitting requirements. Two hours of lecture per week.

Pre-Requisites

[[EGM-320]]

CE-263. STRUCTURAL ANALYSIS
Credits: 3

Introduction to structural concepts and techniques for analyzing trusses, determinate and indeterminate beams, and frame structures. Apply concepts from statics and mechanics of materials to determine internal forces and deflections of structural members and systems, including loads and load paths. Three hours of lecture per week.

Pre-Requisites

[[ME-232]]

CE-311. GEOTECHNICAL ENGINEERING
Credits: 3

Analysis and design of earth dams, including seepage, piping, and slope stability analyses. Case history studies involving landslides, settlement, and expansive soil problems, and design of repair methodologies for those problems. Three hours of lecture per week.

Pre-Requisites

[[CE-231]]

CE-321. OPEN CHANNEL HYDRAULICS
Credits: 3

Application of the conservation of energy and momentum equations to open channel systems, including the analysis of open channel hydraulic structures. Three hours of lecture per week.

Pre-Requisites

[[ME-321]]

CE-325. SUSTAINABILITY ENGINEERING
Credits: 3

This course entails a study of the concept of sustainability and will examine why knowledge of sustainability principles and initiatives are important engineering tools. Concepts including life cycle thinking and analysis, industrial ecology, and the use of energy and mass balances in sustainable system design will be examined. Three hours of lecture per week.

Pre-Requisites

[[EES-240]]

CE-327. ADVANCED CIVIL ENGINEERING GRAPHICS
Credits: 2

Advanced used of AutoCAD modeling software focusing on the areas of drafting designed systems, producing documentation, and project workflows. Two hours of lecture per week.

Pre-Requisites

[[ME-180]]

CE-332. MATRIX STRUCTURAL ANALYSIS
Credits: 3

Analysis of trusses and frames including three-dimensional structures. Use of computer models as a tool for complex structures. Three hours of lecture per week.

Pre-Requisites

[[CE-263]]

CE-334. TIMBER, STEEL, AND CONCRETE DESIGN
Credits: 3

Covers material behavior, external loads, and the design of tension, compression, and flexural members; simple connections used in design; design of columns and footings. Three hours of lecture per week.

Pre-Requisites

[[CE-263]]

CE-336. LOADS FOR CIVIL STRUCTURES
Credits: 3

The course focuses on the theory and building code requirements for civil structural loadings that are used in design. The loads and load combinations will include dead loads, occupancy live loads, snow loads, wind loads, and seismic loads. Three hours of lecture per week.

Pre-Requisites

[[CE-263]]

CE-342. FOUNDATION ENGINEERING
Credits: 3

Procedures used to design footings, piled foundations, retaining walls, marine structures, and slopes. Three hours of lecture per week.

Pre-Requisites

[[CE-311]]

CE-344. GEOSYNTHETICS ENGINEERING
Credits: 3

Analysis of geosynthetic materials and geotextiles that are widely used in highway, landfill, and embankment design. Develop designs for filters, soil separators, reinforced earth, and impermeable membranes. Three hours of lecture per week.

Pre-Requisites

[[CE-231]]

CE-346. ROCK ENGINEERING
Credits: 3

Analysis of the applied behavior of rock encountered primarily in civil engineering projects. Topics include rock classification, rock durability, rock mass strength classification, use of stereo nets, rock reinforcement, blasting, rock socket application and bearing capacity on rock. Three hours of lecture per week.

Pre-Requisites

[[CE-231]], [[GEO-101]]

CE-362. RIVER AND FLOODPLAIN HYDRAULICS
Credits: 3

Analysis of natural channels and designed channels, flow transitions, non-uniform flow, and unsteady flow. Includes erosion control and modeling using HEC-RAS. Three hours of lecture per week.

Pre-Requisites

[[CE-321]], [[ENV-321]]

CE-390. CIVIL ENGINEERING SEMINAR
Credits: 1

Course will focus on project selection, design concepts and constraints, literature review and preliminary data collection for the senior projects course.

Pre-Requisites

Junior standing in Civil Engineering or departmental permission.

CE-391. SENIOR PROJECTS I
Credits: 1

Design and development of selected projects in the various fields of engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper and detailed progress report are required. One hour of lecture per week.
Click here for course fees.

Pre-Requisites

[[CE-390]], Department Permission

CE-392. SENIOR PROJECTS II
Credits: 2

Design and development of selected projects in the field of engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. This is a continuation of CE 391. A professional paper to be presented and discussed in an open forum is required. Two hour of lecture per week.

Click here for course fees.

Pre-Requisites

[[CE-391]]

COM. COMMUNICATION STUDIES

COM-101. FUNDAMENTALS OF PUBLIC SPEAKING
Credits: 3

Principles of study, application, and evaluation of public speaking. Emphasis will be upon meeting the needs of students through individualized instruction in oral communication settings. Taught every semester.

COM-102. PRINCIPLES OF COMMUNICATION
Credits: 3

This course is an introduction to understanding the role of theory in communication studies. We will study traditions, contexts, and theories of communication and acquaint ourselves with communication as a process. We will also learn how to do research in communication studies and examine formal approaches to research within the communication discipline, including qualitative and quantitative methods Along the way, we will lay the foundation for further coursework in the discipline and begin to prepare for our professional pursuits in communication fields.

COM-124. MASS MEDIA LITERACY
Credits: 3

This is a survey course that takes a literacy approach to the study of mass media and their role in society. This course examines the historical, economic, cultural and political aspects of the mass media, and explores how media influence and shape public opinion and attitude. The class will identify techniques to become more media literate as individuals and a society.

COM-144. DEPARTMENT PRACTICUM
Credits: 1-2

A-Debate and Forensics; **B**-P.R. Agency; **C**- WCHL Radio; **D**-The Beacon; **E**-Television; **F**- Department. The Department Practicum may be taken for one or two credits per semester with the total not to exceed six credits. Students may earn credit for major roles and positions of major responsibility in the above co-curricular activities. Credit for participation in these activities is optional, and voluntary participation (without credit) is also encouraged. The department, through the advisor or instructor of the activity, has the authority to approve or reject any contract for credit under this designation. Credits earned are applicable toward graduation, but do not count toward the degree requirements of any concentration in Communication Studies. Written approval of credit must be by advisor and Department chairperson. Taught every semester.

COM-201. ADVANCED PUBLIC SPEAKING
Credits: 3

In this class, students will improve upon communication skills learned in COM 101. In addition, they will develop an understanding and appreciation of the study and practice of rhetoric and communication in historical and contemporary contexts. Special attention will be paid to the functions and influences of speaking and listening in a democracy. Students' understanding and appreciation of the art of rhetoric, as well as their critical orientation toward it, will be cultivated through in-class discussions of course readings and other materials, the composition and delivery of multiple public presentations, the analysis of public address texts and contexts, and the application of active and mindful listening skills.

COM-202. INTERPERSONAL COMMUNICATION
Credits: 3

Interpersonal, or dyadic, relational communication, is a critical component of human social interaction. In this course, we will explore the role of interpersonal communication in our individual lives and in society as a whole. We will not only learn the scholarly concepts and theories of interpersonal communication, we will also examine how we and others engage in interpersonal communication behaviors and practices. In that process, we will develop an understanding of mindfulness and competence, and generate solutions for improving interpersonal communication mindfulness and competence in and across various environments.

Pre-Requisites

[[COM-102]] or consent of the instructor.

COM-203. SMALL GROUP & TEAM COMMUNICATION
Credits: 3

This course is designed to enable students to improve their decision-making abilities within group and team settings. Emphasis will be placed on team-building, as well as task, leadership and interpersonal skills needed for effective group communication.

Pre-Requisites

[[COM-102]].

COM-204. ARGUMENTATION AND DEBATE
Credits: 3

This course will provide training in the fundamentals of argumentation and debate, with practice in gathering and organizing evidence and support materials. Students will be required to build cases based on policy and parliamentary debate structures. Emphasis will be placed on persuasive techniques including cross examination and research. There will be team building activities that reinforce critical thought, problem solving, and open minded discourse. Students will learn to process information quickly and respond with applied knowledge and excellent communication skills.

Pre-Requisites

[[COM-101]] or consent of the instructor.

COM-206. BUSINESS AND PROFESSIONAL COMMUNICATION
Credits: 3

In this class, students will develop theoretical and practical knowledge of professional communication broadly, critically interrogate the language and practices of “professionalism,” and apply course materials and critical thinking skills to the current job market, economy, and globalized context in which we live. Course readings, discussions, and assignments emphasize the significance of communication competence at different stages in the job search process, including preparing pre-interview documents, practicing and applying interview skills, interacting with others in multiple organizational contexts, including small group work, and cultivating and maintaining a professional portfolio in traditional and digital formats.

COM-220. INTRODUCTION TO ELECTRONIC MEDIA
Credits: 3

This course is an overview of the history, institutions, and message systems of the radio, television, cable, satellite, and internet industries. Emphasis is placed on electronic media development as public and commercial institutions, and the functions that they serve in society. The class focuses on the technical and managerial aspects of the telecommunications industry.

COM-222. BROADCAST PRODUCTION
Credits: 3
Fees:

A study of the principles and techniques of audio and video production. A special emphasis is placed on the utilization of these techniques in broadcast settings. Included will be: audio principles & recording, acoustics, camerawork, switching, studio equipment, set design, directing, and producing. After completing this course successfully, students will have the basic knowledge needed to perform a variety of jobs within the broadcasting profession. This course is primarily production oriented, with emphasis on learning by doing. The course progresses from basic concepts and tools of production, to slightly more advanced production techniques and production assignments.

Click here for course fee.

COM-223. THE ART OF FILM
Credits: 3

An introduction to the aesthetics, techniques, and critical analysis of cinematic art through the study of representative films of current and past film directors. The course focuses on key elements in film studies including photography, lighting, editing, sound and acting. Emphasis will placed on the analysis of films as texts.

COM-252. INTERNSHIP
Credits: 3-6

A supervised program of work and study in any of the concentrations. Written permission of the department is required. Offered every semester.

COM-260. BASIC NEWSWRITING
Credits: 3

This course explores the fundamentals of newsgathering, newswriting and news judgment for all media; study of news sources; fieldwork; research; and interview techniques. Students will learn how to write basic news stories using inverted pyramid and narrative writing structures. Students will also be expected to find and interview sources for stories, including subject experts from outside of campus. Basic legal terms and AP style will also be introduced.

COM-261. MULTIMEDIA COMMUNICATION
Credits: 3

This course offers a skills-focused and theoretical approach to multimedia communication. Through a variety of readings, discussions and practical workshops, students will earn basic skills for navigating through multimedia platforms, including, but not limited to social media, apps, and audio/visual modes of communication. Students will be given the tools and information to adapt their knowledge and expertise as media and software packages change. Students will also critically analyze multimedia platforms to better understand their functions and the repercussions of releasing information on (or through) them.

COM-262. DIGITAL STORYTELLING AND DESIGN
Credits: 3

This course offers a hands-on approach to exploring the visual aspects of design and storytelling. Students will be introduced to basic principles of design that are applicable to a variety of career fields. Students also will learn about visual storytelling, the power of visual messages, and the interconnectedness between verbal and visual messages. Through readings, class discussions and workshops, students will gain the knowledge to not only produce effective and quality visual messages, but they will also be challenged to critically analyze visual messages and discuss the ethics behind the messages and the message making process.

COM-300. COMMUNICATION CRITICISM
Credits: 3

From the perspective of communication studies, “criticism” is an essential concept that refers to the interpretive work of analyzing and evaluating the publicly addressed messages that humans produce and consume. In this class, we will explore the history and development of the practice and methods of interpreting human communicative acts, a process known as communication criticism *or* rhetorical criticism. Students will be introduced to and learn multiple modes of criticism, from neo-Aristotelian to feminist, and practice applying those frameworks to selected communicative texts and rhetorical artifacts.

Pre-Requisites

[[COM-101]].

COM-301. PERSUASION
Credits: 3

Persuasion is an inextricable component of human communication, especially as communication is understood broadly as symbolic influence or inducement. In this class, we will explore and critically analyze the historical development of rhetoric and persuasion, study the process and components of persuasion, examine the particular contexts in which rhetoric and persuasion occur, and consider the ethics of persuasion. These objectives will be pursued via several modes, including developing and orally presenting persuasive arguments and critically analyzing and evaluating persuasive messages.

Pre-Requisites

[[COM-101]].

COM-302. FUNDAMENTALS OF PUBLIC RELATIONS
Credits: 3

This course is an introduction to the fundamentals of public relations practice, including program planning and evaluation, media relations, writing for PR, and coordinating special events and functions. Students will work in teams to assist clients in creating long- and short-term PR plans, as well as fulfilling pre-determined goals. Students will also become familiar with project management, as well as networking, in terms of client- and self-promotion.

Pre-Requisites

[[COM-260]].

COM-303. ORGANIZATIONAL COMMUNICATION
Credits: 3

Course focuses on traditional and modern concepts of communication channels in simple and complex organizations. Considerable attention is given to interviewing and conducting communication audits.

Pre-Requisites

[[COM-102]] or consent of the instructor.

COM-304. INTERCULTURAL COMMUNICATION
Credits: 3

Intercultural Communication is a systematic study of what happens when people from different cultural backgrounds interact face-to-face. The course is a balance between theoretical and practical knowledge, with emphasis on immediately usable knowledge. Guest speakers, in-class simulations, cross-cultural interviews, and research projects ask students to apply communication skills to actual intercultural situations.

Pre-Requisites

[[COM-102]] or consent of the instructor.

COM-305. STUDIES IN PUBLIC ADDRESS
Credits: 3

This class is a hybrid or comparative approach to the study of public address in the United States. We will study traditional *and* critical rhetorical theories of public address. We will also engage with speakers and texts that both challenge and reinforce the "great speeches" mold. As we pursue these objectives, we will focus our study on selected social movement rhetorics in the United States, including those of women's and feminist movements, civil rights movements, labor movements, and LGBTQ movements.

Pre-Requisites

[[COM-102]] or consent of the instructor.

COM-306. GENDER AND COMMUNICATION
Credits: 3

Gender is a social construct that is constituted, expressed, and interpreted via the processes of human communication. With that in mind, in this course, we will explore the relationships between gender as a social construct and communication as a symbolic process and critically interrogate the assumption that gender, sex, and sexuality are inextricable categories of personhood. Students will gain theoretical insights and develop analytical skills to identify gendered expectations and interrogate how these expectations impact people of all genders.

COM-320. MEDIA MANAGEMENT
Credits: 3

This course will provide a framework for understanding the functions and methods of media managers in both print and non-print media.

Pre-Requisites

[[COM-220]] or consent of the instructor.

COM-321. ADVANCED MULTIMEDIA REPORTING
Credits: 3

This course combines advanced reporting techniques with multimedia production to create news 'packages'. Students will discuss audience analysis and determine what makes a solid news package for a pa1iicular audience and/or demographic. The class will analyze existing news packages and then split into teams to create their own multimedia news stories that relate not only to the university, but also to the Wilkcs-Barre area. Teams will be responsible for all reporting and multimedia work, including, but not limited to, video, online and photo components. Near the end of the semester, students will present their work to a panel of industry and/or academic professionals for feedback.
Click here for course fee.

Pre-Requisites

[[COM-222]]

COM-322. ADVANCED VIDEO PRODUCTION
Credits: 3

The advanced study of the principles and techniques of video production. Scripting, producing, and editing video are subjects covered in this course. Each student will participate in several video productions. Strong focus on “hands-on” experience, including the production of a mini-documentary. Classroom and studio work places an emphasis on current principles of both multi-camera studio and field production. Creativity, teamwork, time management, distribution or labor, and applied aesthetics are also strongly emphasized.
Click here for course fee.

Pre-Requisites

[[COM-222]] or consent of the instructor.

COM-323. ADVANCED AUDIO PRODUCTION
Credits: 3

This advanced level course builds on the basic skills learned in Broadcast Production with an emphasis on radio and the radio industry. Students will learn the theory and techniques of in depth radio production, including multi-track recording, mixing, signal processing, editing, mastering, creative radio production, and sound design for media. Students will be expected to work independently and within the group to produce broadcast quality production content suitable to be aired on WCLH.
Click here for course fee.

COM-324. COMMUNICATION RESEARCH METHODS I
Credits: 3

A study of the basic foundations in the theory and practice of communication research. The course will review the varied concepts and methods used in designing and conducting research specific to the discipline of Communication Studies and introduce students to the process of applying to the Institutional Review Board for research permission involving human subjects. Emphasis on ability to hone research topics, identify research sources, and write literature reviews. Required of all majors. Taught every fall semester.

Pre-Requisites

[[COM-102]] and [[COM-260]]

COM-325. COMMUNICATION RESEARCH METHODS II
Credits: 3

A focus on the principles and techniques of sampling, data analysis, and data interpretation as applied to communication research. Qualitative and quantitative analyses will be explored, as will fundamental aspects of both descriptive and interpretive statistics. An emphasis is placed on students’ ability to work independently to gather, analyze, interpret, and report original research findings. Required of all majors. Taught every spring semester.

Pre-Requisites

[[COM-324]]

COM-352. ADVANCED PUBLIC RELATIONS CAMPAIGNS
Credits: 3

An advanced course in public relations, taught in seminar format. Emphasis is placed on planning, researching, budgeting, carrying out and evaluating actual public relations campaigns. The course is both writing and speaking intensive. In cooperation with various community-based businesses and non-profit clients, student 'teams' conduct actual semester-long promotional campaigns. Students should be competent in basic newswriting, interviewing, and fundamentals of public relations.

Pre-Requisites

[[COM-302]].

COM-354. INTERNATIONAL FIELD EXPERIENCE IN COMMUNICATION
Credits: 1-6

One to six creditsInternational Field Experience in Communication is an international service-learning experience that focuses on social and communication issues. Students will do a service project related to an area of communication studies including, but not limited to, Broadcast and Print Media, Public Relations, or Strategic Communication. Qualifies for Study Tour Experience (STE) credit pricing. Taught as offered.

COM-361. FEATURE WRITING
Credits: 3

The course explores the study of feature articles for newspapers, magazines and specialized publications (online and otherwise). Students will read and write feature stories as they practice research, interviewing and writing techniques, as well as pitching stories to media outlets. Multimedia storytelling will also be discussed and utilized as students create their narrative pieces.

Pre-Requisites

[[COM-260]].

COM-362. MASS COMMUNICATION LAW
Credits: 3

The course examines current legal problems, theory of controls in journalism, television, and radio; libel, copyright, privacy law, and other legal issues affecting the mass media and free speech. Using a case study approach, students will study current issues, as well as seminal cases. Students will also write case briefs as part of the learning process.

COM-372. MANAGING A PUBLIC RELATIONS AGENCY
Credits: 3

Focus on difference between in-house public relations and agency operators. Students work with several clients.

Pre-Requisites

[[COM-302]].

COM-397. SENIOR SEMINAR/COMMUNICATIONS
Credits: 3

A focus on the principles and application of ethics within the discipline of Communication Studies. Emphasis is placed on in-depth investigation and discussion of current research and ethical issues to provide students with a foundation for making ethical decisions in their professional careers. Through writing, speaking, and discussion of real-world issues and cases, students will examine how ethical decisions are made and how they apply to the field's numerous ethical codes.
This class is also designed to integrate alumni mentoring into its curriculum in order to provide senior communication studies students a wide variety of learning and networking opportunities. By instilling a fundamental basis for practical, ethical decision-making, this class endeavors to act as a bridge between the undergraduate experience and the professional world by providing instruction and mentoring in a wide variety of skills pertinent to professional success. Course taught every spring semester.

Pre-Requisites

Junior or Senior standing.

COM-398. TOPICS
Credits: 1-3

A study of topics of special interest not extensively treated in regularly offered courses. As offered.

COM-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See the Cooperative Education section of this bulletin for placement procedures.) As offered.

Pre-Requisites

Completion of Sophomore year, 2.25 cumulative GPA, consent of academic advisor, and approval of placement by department chairperson.

CS. COMPUTER SCIENCE

CS-198, CS-298, CS-398. TOPICS IN COMPUTER SCIENCE
Credits: Variable

Study of one or more special topics in computer science. May be repeated for credit if different topics are emphasized. Offered when demand warrants.

Pre-Requisites

Varies with topic

CS-115. COMPUTERS AND APPLICATIONS
Credits: 3

An introduction to computers and computing, with emphasis on personal computing in both the Windows and OS X operating systems. Extensive hands-on experience will involve the application of current commercial software (including word processing, database, and spreadsheet). Not open to students who have received credit in any 200-level CS course. Students majoring in either Computer Science or Computer Information Systems will not receive credit for this course.

CS-125. COMPUTER SCIENCE I
Credits: 4

Introduction to information technology and programming (history of computing, text editors, word processing, spreadsheets, introduction to programming), basic data types, functions, decision structures, loops, one- and two-dimensional list structures, testing, debugging, and an introduction to computer graphics. Three hours of lecture and two hours of lab per week. Offered every fall and spring. Click here for course fee.

Co-Requisites

[[MTH-100]] or higher

CS-126. COMPUTER SCIENCE II
Credits: 4

A study of advanced programming concepts, structures, and techniques (professional and ethical issues, testing and debugging, fundamentals of programming, basic data structures—strings, lists, multidimensional arrays, objects, hashes, inheritance, polymorphism, recursion, divide and conquer, machine representation of data, hardware components, machine instructions). Three hours of lecture and two hours of lab per week. Offered every fall and spring. Click here for course fee.

Pre-Requisites

[[CS-125]] with grade of 2.0 or better OR equivalent programming experience.

CS-225. COMPUTER SCIENCE III
Credits: 3

A study of the use of a high-level language to implement basic data structures such as strings, lists, arrays, objects, and hashes, and their application to searching, sorting, and hashing. Representation of numbers and strings at the machine level. The course will also include an introduction to the concepts of algorithm design and problem solving with an emphasis on algorithm development, analysis, and refinement. Offered every fall.
Click here for course fee.

Pre-Requisites

[[CS-126]] with grade of 2.0 or better

CS-226. COMPUTER SCIENCE IV
Credits: 3

A continuation of [[CS-225]]. Topics include programming language paradigms, advanced use of word processors and spreadsheets, including macros, linked data structures, and an introduction to discrete mathematics, including counting, probability, and graphs. Offered every spring.
Click here for course fee.

Pre-Requisites

[[CS-225]] with grade of 2.0 or better

CS-246. C AND UNIX
Credits: 3

An introduction to using Unix operating systems, including shells, file manipulation, text editors, filters, and regular expressions. Fundamentals of C programming, including loops, arrays, functions, recursion, pointers, structures, unions, input/output, and system calls.
Click here for course fee.

Pre-Requisites

[[CS-125]] with grade of 2.0 or better

CS-265. MEDICAL INFORMATICS
Credits: 3

This course will cover basic principles of computer use and information management in health care (including general medicine, dentistry, optometry, and pharmacy). Topics will include basic computing concepts, the characteristics of medical data, and the use of computers in the administrative, diagnostic, and research oriented medical tasks. The course is primarily directed towards students who intend to pursue careers in health-related fields. Offered every spring.
Click here for course fee.

CS-283. WEB DEVELOPMENT I
Credits: 3

An introduction to the development of interactive web sites, including HTML, JavaScript, forms and CGI programs; server side includes cookies, web server configuration and maintenance. Offered in the fall semester of odd-numbered years when demand warrants.
Click here for course fee.

Pre-Requisites

[[CS-126]].

CS-285. MOBILE APPLICATIONS
Credits: 3

An introduction to programming mobile application development. Topics will include cross-platform development; user interface design; touchscreen, GPS, and motion sensing input; memory management; cloud services and network utilization; security and trust considerations; data privacy and ethics.

Click here for course fee.

Pre-Requisites

[[CS-126]] and [[CS-246]].

CS-317. SOFTWARE INTEGRATION
Credits: 3

An introduction to the integration of application programs, including email clients, word processors, spreadsheets, and database systems using Microsoft Office and Visual Basic.
Click here for course fee.

Pre-Requisites

[[CS-126]].

CS-319. PRINCIPLES OF PROGRAMMING LANGUAGES
Credits: 3

A study of the principles that govern the design and implementation of programming languages. Topics include language structure, data types, and control structures. Programming projects will familiarize students with features of programming languages through their implementation in interpreters.
Click here for course fee.

Pre-Requisites

[[CS-226]].

CS-321. SIMULATION AND DATA ANALYSIS
Credits: 3

Methods of handling large databases, including statistical analysis and computer simulations. The emphasis will be upon discrete simulation models with a discussion of relevant computer languages: ARENA, GPSS, and SIMSCRIPT.
Click here for course fee.

Pre-Requisites

[[CS-125]] and [[MTH-111]].

CS-323. THEORY OF COMPUTATION
Credits: 3

This course formalizes many topics encountered in previous computing courses. Topics include languages, grammars, finite automata, regular expressions and grammars, context-free languages, push-down automata, Turing machines, and computability.
Click here for course fee.

Pre-Requisites

[[CS-126]] and [[MTH-231]].

CS-324. SYSTEMS ANALYSIS
Credits: 3
Fees:

A study of the design and implementation of large computer projects. Special emphasis is placed on applications to business systems. Students will use a CASE tool for automated systems analysis and design.
Click here for course fee.

Pre-Requisites

[[CS-225]].

CS-325. DATABASE MANAGEMENT
Credits: 3
Terms Offered: Winter

Practical experience involving the fundamental concepts of database systems including data modeling; query languages; database management system implementation; management of semi-structured and multimedia data; distributed and noSQL databases
Click here for course fee.

Pre-Requisites

[[CS-126]].

CS-326. OPERATING SYSTEM PRINCIPLES
Credits: 3

Analysis of the computer operating systems, including Batch, Timesharing, and Realtime systems. Topics include sequential and concurrent processes, processor and storage management, resource protection, processor multiplexing, and handling of interrupts from peripheral devices.
Click here for course fee.

Pre-Requisites

[[CS-226]].

CS-327. COMPILER DESIGN
Credits: 3

A study of compiler design, including language definition, syntactic analysis, lexical analysis, storage allocation, error detection and recovery, code generation, and optimization problems.
Click here for course fee.

Pre-Requisites

[[CS-226]].

CS-328. ALGORITHMS
Credits: 3

Theoretical analysis of various algorithms. Topics are chosen from sorting, searching, selection, matrix multiplication of real numbers, and various combinatorial algorithms.
Click here for course fee.

Pre-Requisites

[[CS-226]] and [[MTH-232]].

CS-330. COMPUTER ARCHITECTURE
Credits: 3

A study of the design, organization, and structure of computers, ranging from the microprocessors to the latest 'supercomputers.' An emphasis will be placed on machine language, instruction formats, addressing modes, and machine representation of numbers.
Click here for course fee.

Pre-Requisites

[[CS-226]].

CS-334. SOFTWARE ENGINEERING
Credits: 3

A course in 'programming in the large.' Topics include software design, implementation, validation, maintenance, and documentation. There will be one or more team projects.
Click here for course fee.

Pre-Requisites

[[CS-226]].

CS-335. DATA SCIENCE AND INFORMATION RETRIEVAL
Credits: 3

Practical experience involving unstructured data collections. Topics cover big data, data mining, predictive modeling, decision analysis and indexing and retrieval including probabilistics, clustering, thesauri and passage based retrieval strategies.
Click here for course fee.

Pre-Requisites

[[CS-325]] or [[CS-340]]

CS-340. ARTIFICIAL INTELLIGENCE
Credits: 3

This course will provide an overview of artificial intelligence (AI) application areas and hands-on experience with some common AI computational tools. Topics include search, natural language processing, theorem proving, planning, machine learning, robotics, vision, knowledge-based systems (expert systems), and neural networks.
Click here for course fee.

Pre-Requisites

[[CS-126]].

CS-350. OBJECT-ORIENTED PROGRAMMING
Credits: 3

Object-oriented concepts and their application to human-computer interaction. Concepts to be covered include objects, classes, inheritance, polymorphism, design patterns, GUI interface guidelines, and design of interfaces. There will be programming projects in one or more object-oriented languages using one or more GUI interface guidelines.
Click here for course fee.

Pre-Requisites

[[CS-226]].

CS-355. COMPUTER NETWORKS
Credits: 3

This course introduces basic concepts, architecture, and widely used protocols of computer networks. Topics include the Open System Interconnection (OSI) model consisting of physical link layer, data layer, network layer, transport layer, session layer, presentation layer, and application layer, the medium access sublayer and LAN, various routing protocols, Transmission Control Protocol (TCP), and Internet Protocol (IP) for internetworking.
Click here for course fee.

Pre-Requisites

[[CS-225]] and [[CS-246]]

CS-363. OPERATIONS RESEARCH
Credits: 3

A survey of operations research topics such as decision analysis, inventory models, queuing models, dynamic programming, network models and linear programming. Cross-listed with [[MTH-363]].
Click here for course fee.

Pre-Requisites

[[CS-125]], and [[MTH-111]].

CS-364. NUMERICAL ANALYSIS
Credits: 3

An introduction to numerical algorithms as tools to providing solutions to common problems formulated in mathematics, science, and engineering. Focus is given to developing the basic understanding of the construction of numerical algorithms, their applicability, and their limitations. Cross-listed with [[MTH-364]]. Offered Spring odd years.

Pre-Requisites

[[MTH-211]]and [[CS-125]] (or equivalent programming experience).

CS-366. 3 DIMENSIONAL ENVIRONMENTS AND ANIMATION
Credits: 3

This course will explore the foundations of 3-dimensional animation processes as they apply to multiple mediums. Students will build computer-based models and environments, texture, light, animate, and render content for Integrative Media projects or as stand-alone pieces. Cross-listed with [[IM-350]].
Click here for course fee.

Pre-Requisites

[[CS-126]] or [[IM-201]].

CS-367. COMPUTER GRAPHICS
Credits: 3
Fees:

Introduction to equipment and techniques used to generate graphical representation by computer. Discussion of the mathematical techniques necessary to draw objects in two- and three-dimensional space. Emphasis on application programming and the use of a high-resolution color raster display.
Click here for course fee.

Pre-Requisites

[[CS-226]].

CS-368. 3 DIMENSIONAL GAME DEVELOPMENT
Credits: 3

An overview of simulation, engine-based, and real-time game systems with a focus on theory, creation, and animation of three-dimensional models used within a game context. Cross-listed with [[IM-368]].
Click here for course fee.

Pre-Requisites

[[CS-366]]/IM 350 or [[CS-367]].

CS-370. SPECIAL PROJECTS
Credits: variable

Requirements: Senior standing and approval of the department chairperson.

CS-383. WEB DEVELOPMENT II
Credits: 3

An introduction to the development of dynamic, database-driven sites, including active server pages, PHP, authentication, session tracking and security, and the development of shopping cart and portal systems.
Click here for course fee.

Pre-Requisites

[[CS-283]]. [[CS-325]].

CS-391. SENIOR PROJECTS I
Credits: 1

Design and implementation of a software project under the direction of a faculty member. Students will normally work in teams. Detailed requirements and design documents are required and will be presented at the end of the semester. Offered every fall.
Click here for course fee.

Pre-Requisites

[[CS-334]] or [[CS-324]].

CS-392. SENIOR PROJECTS II
Credits: 2

Design and implementation of a software project under the direction of a faculty member. Students will normally work in teams. Production of a finished product, including software and documentation, is required. There will be an open forum presentation of the project at the end of the semester. Offered every spring.
Click here for course fee.

Pre-Requisites

[[CS-391]].

CS-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experiences, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. See the Cooperative Education section of this bulletin for placement procedures. Requirements: Sophomore standing; minimum 2.0 cumulative GPA; consent of the academic advisor; and approval of placement by the department chairperson.

DAN. DANCE

DAN-100. DANCE APPRECIATION: COMPREHENSIVE DANCE FORMS
Credits: 3

This course provides a general introduction to classical ballet, modern dance and jazz dance. It is designed to provide a structured, personal engagement in dance whose objective is the acquisition, at each individual student's pace, of the qualities of grace, physical stamina, muscular and ligament flexibility, and movement musicality.

DAN-120. TAP DANCE
Credits: 3

In this course, students will acquire and develop tap dance technique through drills and exercises, and will develop an appreciation of the rich history of tap dance in America through lectures, videos, demonstrations and readings.

DAN-210. MODERN DANCE I
Credits: 3

This course provides the student with the fundamentals of modern dance based on the methodology of Lester Horton. It is designed to provide an experimentation structure and professionally-informed exploration of the art of modern dance. Its objective is the acquisition, at each individual student's pace, of the qualities of grace, physical stamina, muscular alignment, flexibility, and movement musicality. This course also introduces fundamentals of contemporary dance allowing the student to investigate how this genre of dance has pulled elements of movement from classical, modern and jazz styles.

DAN-211. MODERN DANCE II
Credits: 3

This course is the sequel to DAN-210, providing the truly committed student with the opportunity, at an intermediate level, for an even more substantive and diversified participatory engagement in modern and contemporary dance. It engages the student-dancer in highly individualized movements based on personalized, multi-faceted, and changing artistic standards.

Pre-Requisites

[[DAN-210]] or permission of instructor.

DAN-220. ADVANCED TAP
Credits: 3

In this course, students will acquire and develop advanced tap dance technique through drills and exercises, and will develop an appreciation of the rich history of tap dance in America through lectures, videos, demonstrations and readings.

Pre-Requisites

[[DAN-120]] or permission of instructor.

DAN-230. JAZZ DANCE I
Credits: 3

The first course involving an intensive and progressively challenging engagement in jazz technique and performance utilizing a fusion of methodologies all of which are ballet based. This course is designed for the student with limited dance experience, still having a basic understanding of ballet terminology and body placement. Core skills as well as body conditioning are emphasized, investigating different genres within the context of the jazz discipline. Classical Jazz, Musical Theatre Jazz, Video Style Jazz, and Lyrical Styles of Jazz will be introduced.

DAN-231. JAZZ DANCE II
Credits: 3

The second in the progressively demanding courses in the four-semester sequence in which students are intensively engaged in learning and executing jazz techniques and performance skills by utilizing a fusion of methodologies, all of which are ballet based. Through the study of jazz dance techniques as systematized using various methods, students are encouraged to perceive the nature of dance movement and to acquire some proficiency in its application to stage performance and achieve greater awareness of body structure and function. Select choreographers, directors, and teachers will play a significant role in the material chosen for this course.

Pre-Requisites

[[DAN-230]] or permission of instructor.

DAN-250. CLASSICAL BALLET I
Credits: 3

The first course in the study of the theory and techniques of Russian classical ballet, as pursued in the curricula of the schools of the Bolshoi and Kirov Ballets and derived from the methodology devised by Agrippina Vaganova and Cecchetti.

DAN-251. CLASSICAL BALLET II
Credits: 3

This course is designed to build on the foundation acquired in [[DAN-250]] for an intensive intellectual, emotional, and physical engagement in the study of the theory and techniques of Russian classical ballet, as pursued in the curricula of the schools of the Bolshoi and Kirov Ballets and derived from the methodology devised by Agrippina Vaganova and Cecchetti.

Pre-Requisites

[[DAN-250]] or permission of instructor.

DAN-310. MODERN DANCE III
Credits: 3

This is an advanced course in modern dance, affording the student the opportunity to engage, experientially, in some of the more technically and choreographically demanding and innovative aspects of modern dance. In the exploration of these movement elaborations, the aesthetic vision of the choreographers may be perceived, especially in terms of how they adapted much of the disciplined technique of classical ballet in an exciting syncretic fusion.

Pre-Requisites

[[DAN-211]] or permission of instructor.

DAN-311. MODERN DANCE IV
Credits: 3

An advanced level course in Modern Dance technique. In addition to continued study of the concepts from [[DAN-310]], specific contemporary styles will be explored.

Pre-Requisites

[[DAN-310]] or permission of instructor.

DAN-320. DANCE COMPOSITION
Credits: 3

An introduction to the craft of making dance works. Class emphasis is on developing movement material, structuring solid dance works and documenting the creative process. A writing component is required.

Pre-Requisites

Permission of instructor.

DAN-330. JAZZ DANCE III
Credits: 3

Jazz Dance III is third in the progressively demanding courses in the four-semester elective sequence in which students are intensively engaged in learning and executing jazz techniques and performance skills using various methodologies, all of which are ballet based. Students at this level are expected to have a greater understanding of ballet terminology and body placement. Emphasizing a blending of theory and practice, this course is intended to encourage students to explore another dimension of personal fulfillment while cultivating realistically their potential as physically coordinated, aesthetically sensitive, poised, and graceful persons, with a deeper understanding of dance as recreation vs. dance in a professional environment relating to theatre studies. Within this course, the student will investigate the intent of the choreographer and director as well as experience the choreographic process itself. Creativity, logic, and reasoning skills will be enhanced, with the intention of aiding the student in transferring these aspects to their chosen major. Select choreographers, directors, and teachers will play a significant role in the material presented, with the expectation of the student delving more deeply into the creative process of dance.

Pre-Requisites

[[DAN-231]] or permission of instructor.

DAN-331. JAZZ DANCE IV
Credits: 3

The fourth level in the progressively demanding courses in the four-semester elective sequence in which students are intensively engaged in learning and executing jazz techniques and performance skills per various methodologies, all of which are ballet based. At this level, the student is expected to have an adequate knowledge of ballet terminology, body placement, and body conditioning, with a focus on transferring these skills to choreography, improvisation, class structure, and the creative process itself. This course is intended to take the dance student to a higher level of physical and creative awareness. A greater understanding of physics, as it relates to dance, kinesiology, anatomy, and the processing of more intricate exercises and combinations are a major focus. Once again, select choreographers, directors, and teachers, will play a significant role in the material presented. A deeper understanding of a person's creative potential will be investigated, using life experiences of selected persons.

Pre-Requisites

[[DAN-330]] or permission of instructor.

DAN-350. CLASSICAL BALLET III
Credits: 3

This course is designed to build on the foundation laid in [[DAN-251]]. Course presentation will employ lecture, demonstration, and studio exercises designed to explore the movement dynamics that are especially appropriate to the classical dance genre. The objective of this course is the continued individually paced development of the qualities of grace, physical stamina, muscular and ligament flexibility, and movement musicality, especially via direct and active engagement in classical dance technique.

Pre-Requisites

[[DAN-251]] or permission of instructor.

DAN-351. CLASSICAL BALLET IV
Credits: 3

This course is designed to continue to build on the foundation laid in [[DAN-350]]. Special emphasis will be given in this course to the development of sound classical ballet technique (per a modified Vaganova methodology) as the foundation for the cultivation of poise, stage presence, kinetic flexibility, and physical stamina.

Pre-Requisites

[[DAN-350]] or permission of instructor.

EES. EARTH AND ENVIRONMENTAL SCIENCES

EES-198/298/398. TOPICS IN EES
Credits: Varies with topic

Departmental courses on topics of special interest, not extensively treated in regularly scheduled offerings, will be presented under this course number on an occasional basis. May be repeated for credit.
Click here for fee for courses with a lab.

Pre-Requisites

Varies with topic studied.

EES-105. PLANET EARTH
Credits: 3

The nature of our planet and how it works are examined in the context of Earth as a constantly changing dynamic system. An emphasis on global scale processes and the interaction of humans and their physical environment is coupled with in-depth coverage of how science is done and the scientific principles that influence our planet, its rocks, mountains, rivers, atmosphere, and oceans. Major sub-topical areas in the Planet Earth series may include geology (Forces of Geologic Change), oceanography (The Restless Ocean), astronomy (The Cosmic Perspective), geography (Global Regions and Geography), and the relationship between people and their physical surroundings (The Global Environment). Intended for students who are not majoring in science, engineering, pre-pharmacy, nursing, or B.S. programs in mathematics or computer science. Two hours of lecture and two hours of lab per week.
Click here for course fees.

Pre-Requisites

No previous background in science or college-level mathematics is required.

EES-201. ENVIRONMENTAL ETHICS AND SUSTAINABILITY
Credits: 1

This course entails an examination of the central topics of environmental ethics and sustainability as viewed from the perspectives of science. Ethical and sustainability paradigms that all environmental scientists should be aware of will be studied. Course is delivered online.

Pre-Requisites

[[EES-240]] and [[EES-241]], or permission of the instructor.

EES-210. GLOBAL CLIMATE CHANGE
Credits: 3

The nature and function of earth's global climate are examined from a unified system perspective. Major questions focus on scientific versus public understanding of trends in global temperature, precipitation, and sea level. The course emphasizes negative and positive feedback processes that force key changes in the earth's climate system: past, present, and future. Topics include fundamentals of global and regional heat and water balance, the role of elemental cycles in controlling climate (e.g., the carbon cycle), descriptive climate classification, long-term, short-term, and catastrophic climatic change (e.g., ice ages and bolide impacts), and human effects on climate (e.g., enhanced greenhouse, rising sea level). This course integrates a scientific understanding of climatic change and explores contemporary social and economic policy responses to change scenarios. Three hours of lecture per week.

EES-213. CLIMATE MODELING
Credits: 1

Students will utilize software to construct basic models of Earth Systems. No prior knowledge of the software is assumed or required. Weekly assignments will consist of computer-based modeling exercises, each progressively building upon previous assignments. Specifically, students will utilize software to construct relatively simple models of world population growth, fossil fuel consumption, the global carbon cycle, and the Earth's energy balance. The final modeling exercise couples the population growth, carbon cycle, and Earth energy balance assignments in an effort to explore the effect of future population growth and carbon dioxide emissions on global mean temperature. Two hours of lab per week.

Co-Requisites

[[EES-210]]

EES-218. ENVIRONMENTAL ETHICS
Credits: 3

An examination of the central problems of environmental ethics as viewed from the perspectives of science and of philosophy. The value of nature and 'natural objects,' differing attitudes toward wildlife and the land itself, implications of anthropocentrism, individualism, ecocentrism, and ecofeminism, bases for land and water conservation, and other topics will be examined within a framework of moral and scientific argument. Cross-listed with [[PHL-218]].

Pre-Requisites

[[PHL-101]] or [[EES-240]] and [[EES-241]], or permission of the instructor.

EES-230. OCEAN SCIENCE
Credits: 4

An interdisciplinary approach to the study of the fundamentals of oceanography emphasizing physical, chemical, and biological interrelationships. Three hours of lecture and three hours of lab. Requirements: For CS, Engineering, Math, and Science majors only
Click here for course fees.

EES-240. PRINCIPLES OF ENVIRONMENTAL ENGINEERING & SCIENCE
Credits: 3

A study of physical, chemical, and biological components of environmental systems and a discussion of processes involved in water quality management, air quality management, waste management, and sustainability. Three hours of lecture per week.

Pre-Requisites

[[MTH-111]] or permission of the instructor. Requirements: for CS, Engineering, Math, and Science majors only.

EES-241. PRINCIPLES OF ENVIRONMENTAL ENGINEERING & SCIENCE LAB
Credits: 1

Experiments with and analysis of the physical, chemical, and biological components of environmental systems.
Click here for course fees.

Co-Requisites

[[EES-240]] concurrent or prior.

EES-242. ENVIRONMENTAL HEALTH
Credits: 3

To provide students with an understanding of man's impact on the environment and how those impacts can be controlled or mitigated. Students completing this course should be able to recognize environmental problems and understand control and preventative measures. Three hours of lecture.

Pre-Requisites

Introductory physics and chemistry. Students who have taken [[EES-240]] will be admitted only with the consent of the instructor.

EES-251. SYNOPTIC METEOROLOGY
Credits: 4

Topics include surface and upper air weather systems, weather phenomena, climate, and local weather influences. Synoptic map analysis and interpretation are emphasized. Three hours of lecture and three hours of lab per week. Requirements: For CS, Engineering, Math, and Science majors only
Click here for course fees.

EES-261. REGIONAL GEOGRAPHY
Credits: 3

Topics covered include maps and charts and basic elements of physical, cultural, historical, and economic geography as applied to specific geographic regions. Three hours of lecture per week.

EES-280. PRINCIPLES OF ASTRONOMY
Credits: 4

Topics include orbital mechanics, results of planetary probes, spectra and stellar evolution, and cosmology. Three hours of lecture and three hours of lab per week. Requirements: For Science majors only
Click here for course fees.

EES-302. SCIENCE RESEARCH AND COMMUNICATION
Credits: 1

The aim for this course is to provide students with the necessary foundation to think critically about scientific research and communication. The course introduces students to the (1) philosophy of science, (2) design, execution, and evolution of scientific projects, (3) exploration, evaluation, and management of scientific literature, (4) methods and ethics of scientific communication, and (5) proposal design for a project to be continued into Senior Project (EES/GEO 391/392) that includes a literature review, definition of research questions, objectives, or testable hypotheses, and the methods used to carry out the project. The broader social and political context in which scientific research is situated and must respond to and interact with is also explored. More than that, this course explores the important connections between research design and communication by having students focus on the application of learned theory and skills to projects with Senior Project advisor.

Pre-Requisites

Junior standing.

EES-304. ENVIRONMENTAL DATA ANALYSIS
Credits: 2

To acquaint students majoring in earth and environmental sciences with the techniques and methods of data acquisition and analysis, including environmental sampling methodology and data management. Emphasis will be placed on examination of real data sets from various areas of the earth and environmental sciences with particular emphasis placed on using and applying graphical and statistical procedures used in [[EES-391]]-392 (Senior Projects). Two hours of lecture per week.

Pre-Requisites

[[MTH-150]] and Junior standing or permission of the instructor.

EES-340. CONSERVATION BIOLOGY
Credits: 3

This course covers the major topics of conservation biology including an introduction to biodiversity, threats to biodiversity, and solutions to diminish extinctions and population declines. Lecture: three hours per week. Offered each year. Cross-listed with [[BIO-340]].

Pre-Requisites

[[BIO-225]] - [[BIO-226]] or permission of the instructor.

EES-341. FRESHWATER ECOSYSTEMS
Credits: 3

A study of the biological and ecological aspects of streams, lakes, and wetlands from a watershed perspective. An initial introduction to physical, chemical, and geological principles of limnology is followed by a focus on freshwater biology. Laboratories include field-based watershed investigations and lake management assessments using geographic information systems techniques. Cross-listed with [[BIO-341]]. Two hours of lecture and three hours of lab per week. Offered in alternate years.
Click here for course fees.

Pre-Requisites

[[GEO-101]] - [[GEO-103]], or [[EES-240]] - [[EES-241]], or [[BIO-121]] - [[BIO-122]] or permission of the instructor.

EES-343. MARINE ECOLOGY
Credits: 3

An examination of the biology of marine life within the context of modern ecological principles. The structure and physiology of marine organisms will be studied from the perspectives of adaptation to the ocean as habitat, biological productivity, and interspecific relationships. Emphasis will be placed on life in intertidal zones, estuaries, surface waters, and the deep sea. Two hours of lecture and three hours of lab per week. Cross-listed with [[BIO-343]]. Offered in alternate years.
Click here for course fees.

Pre-Requisites

[[EES-230]] and [[BIO-121]] - [[BIO-122]] or permission of the instructor.Students must have formal course experiences in oceanography and biology at the science major level or have completed their sophomore year as a biology major.

EES-344. ECOLOGY
Credits: 4

Ecology examines contemporary ecological thinking as it pertains to the interrelationships of organisms and their environments. Interactions at the populations and community level are emphasized. Two hours of lecture and three hours of lab per week. Cross-listed with [[BIO-344]]. Offered in alternate years.
Click here for course fees.

Pre-Requisites

[[BIO-121]] - [[BIO-122]] or permission of the instructor.

EES-366. FIELD BOTANY
Credits: 3

This is a specialized summertime field course, which emphasizes a taxonomic, phylogenetic, and ecological survey of higher plants indigenous to Northeastern Pennsylvania. Due to the extensive field work, enrollment is somewhat more restricted than in other courses; therefore, written permission from the instructor is the primary prerequisite for those upperclassmen who wish to register for the course. Cross-listed with [[BIO-366]]. Offered in alternate years.
Click here for course fees.

Pre-Requisites

[[BIO-121]] - [[BIO-122]] or permission of the instructor.

EES-390. ENVIRONMENTAL SCIENCE SEMINAR
Credits: 3

This course is presented seminar-style, focusing on Environmental Science topics relevant to current problems, trends, and news. The course serves as an open and constructive venue where students will have an opportunity to delve into themed topics and more holistically discuss environmental science issues. The theme of the course will change each term, but will remain within the Environmental Sciences: ecology, environmental chemistry, sustainability, climate change, hazardous waste, etc. Students are required to read and actively discuss scientific literature, assemble and analyze relevant data, formulate and criticize quantitative/ qualitative theories, and explore case studies. Three hours of seminar per week. Requirement: students with senior standing only.

EES-391. SENIOR PROJECTS I
Credits: 1

Design and development of selected projects in earth and environmental sciences and other related fields under the direction of a staff member. Technical as well as economical factors will be considered in the design. A professional paper and detailed progress report are required.
Click here for course fees.

Pre-Requisites

Department permission

EES-392. SENIOR PROJECTS II
Credits: 2

Design and development of selected projects in earth and environmental sciences and other related fields under the direction of a staff member. Technical as well as economical factors will be considered in the design. A professional paper to be presented and discussed in an open forum is required.
Click here for course fees.

Pre-Requisites

[[EES-391]] or department permission. (See the department for more details about the department permission.)

EES-394. FIELD STUDY
Credits: 1-3

On-site study of an earth or environmental problem or situation incorporating field documentation and investigative techniques. May be repeated for credit when no duplication of experience results. One hour of lecture, plus field trips.
Click here for course fees.

Pre-Requisites

[[EES-240]], [[EES-241]], [[GEO-101]] and [[GEO-103]].

EES-395. AND 396. INDEPENDENT RESEARCH
Credits: Varies with topic1-3 credits.

Independent study or research of specific earth or environmental science topic at an advanced level under the direction of a departmental faculty member.
Click here for course fees.

Pre-Requisites

Upper class standing and approval of academic advisor, research advisor, and department chairperson.

EES-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. See the Cooperative Education section of this bulletin for placement procedures.

Pre-Requisites

Sophomore standing; minimum 2.0 cumulative GPA; consent of the academic advisor; and approval of placement by the department chairperson.

EES-498. TOPICS
Credits: Varies with topic

Departmental courses on advanced topics of special interest, not extensively treated in regularly
scheduled offerings, will be presented under this course number on an occasional basis. Available for either undergraduate or graduate credit. May be repeated for credit.
Click here for fee for courses with a lab.

Pre-Requisites

Senior or graduate standing

EC. ECONOMICS

EC-101. PRINCIPLES OF ECONOMICS
Credits: 3

Presents basic economic problems and shows how these problems are solved in a free enterprise economy; the effects of the increasing importance of the economic role of government; the nature of national income and the modern theory of determination; how money and backing, fiscal policy, and monetary policy fit in with income analysis and keep the aggregate system working. The course deals mainly with macroeconomic problems.

EC-102. PRINCIPLES OF ECONOMICS II
Credits: 3

Based upon a broad microeconomic foundation concentrating on such units as the consumer, the firm, and the industry. A general view of the free market system; the economics of the firm and resource allocation under different market structures; production theory; pricing and employment resources; economic growth and development.

EC-230. MONEY AND BANKING
Credits: 3

A study of money, credit, and banking operations. Monetary standards, development of the American monetary and banking system. Recent developments in other financial institutions. Central banking and the Federal Reserve System; instruments of monetary control; international monetary relationships. (Cross-listed with [[BA-230]].)

EC-320. THE ECONOMICS OF CRIME
Credits: 3

A study of the economic approach to crime and crime prevention. The course will apply economic analysis to such areas of interest as deterring crime, the impact of criminal activity, the allocation of crime-fighting resources, crimes against people, property crime, and victimless crimes. Controversial issues such as the desirability of the death penalty and gun control legislation will be featured.

Pre-Requisites

[[EC-102]].

EC-330. PUBLIC FINANCE
Credits: 3

Fundamental principles of public finance, government expenditures, revenue, financial policies and administration, taxation, principles of shifting and incidence of taxation, public debts and the budget, fiscal problems of federal, state, and local government, the relation of government finance to the economy.

Pre-Requisites

[[EC-101]] and 102.

EC-340. INTERNATIONAL TRADE AND FINANCE
Credits: 3

Classical and Neo-classical theories of trade; qualifications of the pure theory; new theories of trade; the transfer of international payments and the determination of foreign exchange rates; the balance of international payments; tariffs and other trade barriers; United States commercial policy and the General Agreement on Trade and Tariffs; current issues.

Pre-Requisites

[[EC-101]] and 102.

EC-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See the Cooperative Education section of this bulletin for placement procedures.)

Pre-Requisites

Sophomore standing, minimum 2.0 cumulative GPA, consent of academic advisor, approval of placement by department chairperson.

ED. EDUCATION

ED-180. EDUCATIONAL PSYCHOLOGY (FORMERLY ED 200)
Credits: 3

This course is designed to present Education Psychology as a distinct discipline concerned with understanding the processes of learning and teaching and developing ways of improving these processes. In this course, students will identify and apply knowledge derived from the behavioral sciences to the solutions of educational problems. The course focuses on the psychology and the development of learners, psychosocial principles of learning and motivation, and their applications, and research based classroom management techniques. Emphasis is placed on effective classroom communication and interpersonal relationships. Offered fall and spring semesters.

ED-190. EFFECTIVE TEACHING WITH FIELD EXPERIENCE
Credits: 3

Education 190 emphasizes concepts and skills for effective teaching. These skills include instructional techniques, research, writing, and field experiences. Students will be involved in their first 40-hour field experience. [[ED-190]], Effective Teaching, provides a critical overview of historical, intellectual, social and political foundations of American education. Analysis of differing views on the relationship of public schools and American society is stressed. The course explores current controversies and issues that will impact schools and teachers in the years ahead. Departmental permission required. Offered fall and spring semesters.

ED-191. INTEGRATING TECHNOLOGY INTO THE CLASSROOM (FORMERLY ED 215)
Credits: 3

This course is designed to build upon a basic foundation in educational technology. Future teachers develop knowledge and skills in selection, evaluation, and utilization of various instructional technologies. The application of new technologies to teaching and learning will be emphasized, along with performance-based activities in instructional design. A major portion of the course is devoted to the integration of technology-based instructional activities in the PK-12 curriculum.

Pre-Requisites

[[ED-190]]. Offered fall and spring semesters.

ED-220. TEACHING CULTURALLY AND LINGUISTICALLY DIVERSE LEARNERS (OPO COURSE)
Credits: 3

This course will address the urgent need for multicultural education by covering topics such as racism, bias, and cultural information in order to help students develop strategies for creating within their classrooms knowledge of, appreciation of, and respect for diversity. Teaching strategies for English Language Learners and issues relevant to ELLs, particularly immigration and globalization, will be discussed. The course will also help students develop the knowledge base and instructional skills necessary to teach their future students basic world geography in order to understand the cultural and political effects that geography has had on the diverse cultural groups included in the American educational system.

Pre-Requisites

[[ED-190]]. Offered fall and spring semesters.

ED-264. CHILD DEVELOPMENT AND COGNITION -- CLASSROOM APPLICATION
Credits: 3

Through this course, students must learn and be able to apply major concepts and theories related to the development of young children and they must be able to develop, implement, assess, and modify curriculum and lessons. Students must demonstrate understanding of the way in which classroom environments influence children's learning. Students must demonstrate proficiency with Pennsylvania's Early Childhood Learning Standards. A 30-hour field experience accompanies this course. Departmental permission is required.

Pre-Requisites

[[ED-190]] and [[ED-263]]. Offered spring semesters.

ED-300. TEACHING OF FOREIGN LANGUAGE WITH FIELD EXPERIENCE
Credits: 3

This course is a study of instructional methodology in foreign language acquisition at the secondary education level. A 40-hour field experience is required. Departmental permission is required.

Pre-Requisites

Admission to the Teacher Education Program. Offered fall semesters.

ED-321. LITERACY FOUNDATIONS I
Credits: 3

This course will provide students with basic concepts of literacy instruction: emphasis on the nature of literacy development; the nature of the learner; and literacy development as an interactive process. This course requires completion of a 30-hour field experience. Departmental permission is required.

Pre-Requisites

Admission to the Teacher Education Program. Offered fall semesters.

ED-322. LITERACY FOUNDATIONS II
Credits: 3

The course is designed to investigate and analyze major instructional methods for teaching literacy. The material is based upon current research theories and findings and includes topics recognized by theorists and practitioners as being most critical to developing effective school literacy programs. The course will include literature based reading programs, classroom organization, and assessment. The class will also require students to become more familiar with Pennsylvania standards and anchors and apply that knowledge to their planning.

Pre-Requisites

Admission to the Teacher Education Program. Offered spring semesters.

ED-323. DIFFERENTIATED READING
Credits: 3

The purpose of this course is to develop knowledge and skill in classroom-based reading assessment to diagnose students' reading strengths and needs. A range of assessment devices and their use in the diagnosis of reading difficulties will be studied. An analysis of data and the determination of instructional interventions will be emphasized.

Pre-Requisites

Admission to the Teacher Education Program and [[ED-321]]. Offered fall semesters.

ED-324. CHILDREN'S LITERATURE
Credits: 3

This course will involve students in actively reading a wide range of children's and adolescent literature accompanied with an analysis of literary elements and genre. Emphasis will be placed on instructional methods that incorporate the use of literature across the curriculum with attention given to the careful selection of books to match the instructional levels of young readers.

Pre-Requisites

Admission to the Teacher Education Program. Offered fall and spring semesters.

ED-325. APPLIED READING STRATEGIES
Credits: 3

This course is designed to extend the foundational knowledge of reading instruction learned in [[ED-321]]: Literacy Foundations I, with an emphasis on the application of this knowledge in the design of instructional planning and delivery. Application of the course content is demonstrated in the teaching of children enrolled in the Wilkes University Reading Academy or in a regional school. The ability to develop effective reading plans and activities and apply these strategies with children in an interactive setting is the essence of this course.

Pre-Requisites

Admission to the Teacher Education Program, [[ED-321]], [[ED-323]] and permission of the instructor. Offered spring and summer semesters.

ED-330. MATHEMATICS IN EARLY CHILDHOOD AND ELEMENTARY EDUCATION
Credits: 3

This course is designed to present a study of research, concepts and methodologies pertinent to the teaching of mathematics from the PK through 4th grade levels. In this course, emphasis is placed on 1) the knowledge necessary to guide children to become mathematically literate, 2) the implementation of planning and instructional techniques based on the NCTM Curriculum Standards, the PA Academic Standards and the PDE Assessment Anchors as well as principles of the NAEYC, and 3) the use of concrete manipulation to facilitate the learning process.

Pre-Requisites

Admission to the Teacher Education Program. Offered fall semesters.

ED-341. LANGUAGE ARTS IN EARLY CHILDHOOD AND ELEMENTARY EDUCATION (OPO COURSE)
Credits: 3

The purpose of this course is to inform and actively involve prospective teachers in the most developmentally effective methods for teaching language arts at the early childhood and elementary school levels. The course focuses on the language arts skills of writing, speaking, listening, viewing, and reading with emphasis on the writing process, literature-based lesson planning, and integrated language arts approaches. The incorporation of children's literature and the study of various genres are fundamental to this course.

Pre-Requisites

Admission to the Teacher Education Program. Offered spring semesters.

ED-344. ASSESSMENT IN EARLY CHILDHOOD AND ELEMENTARY EDUCATION
Credits: 3

This course acquaints students with guidelines for use of developmentally appropriate formal and informal assessment for early childhood education and early intervention programs. Feature are commonly used standardized evaluation instruments, tests aligned with PA Early Learning Standards, as well as systems of authentic assessment.

Pre-Requisites

Admission to the Teacher Education Program. Offered fall semesters.

ED-345. ASSESSMENT IN EDUCATION
Credits: 3

This course will address a number of different professional areas both of theoretical importance and practical significance. Assessment concepts will provide a framework to critically analyze any assessment, whether commercial of teacher-made. Practical skills will enable the pre-service teacher to assess a wide variety of learning goals and teaching experiences within cognitive, affective, and psychomotor domains. Finally, these assessment concepts and skills will be examined within the context of Pennsylvania Academic Standards and the Pennsylvania mandated assessment (PSSA).

Pre-Requisites

Admission to the Teacher Education Program. Offered fall and spring semesters.

ED-350. THE ARTS IN EARLY CHILDHOOD AND ELEMENTARY EDUCATION
Credits: 3

This course is designed as an exploration of the importance of the arts in the development of children in the cognitive, affective, and psychomotor domains. Students will discover how the arts are related to our natural and manmade environments and learn specific teaching methodologies that foster creativity and the integration of the arts with other subject areas.

Pre-Requisites

Admission to the Teacher Education Program. Offered fall and summer semesters.

ED-360. SOCIAL STUDIES IN EARLY CHILDHOOD AND ELEMENTARY EDUCATION
Credits: 3

In this course, students will gain an understanding of teaching Social Studies at the early childhood and elementary school levels. Students will develop their personal philosophy of the purpose of Social Studies, review National curriculum guidelines and PA state standards, and explore a variety of teaching strategies.

Pre-Requisites

Admission to the Teacher Education Program. Offered fall semesters.

ED-370. SCIENCE IN EARLY CHILDHOOD AND ELEMENTARY EDUCATION
Credits: 3

This course presents a study of the methods and curriculum for teaching science to young children. Emphasis is placed on instruction that is activity oriented and leads to the development of science process skills, problem-solving strategies, and well-developed conceptual frameworks.

Pre-Requisites

Admission to the Teacher Education Program. Offered spring semesters.

ED-371. TEACHING METHODS IN SCIENCE WITH FIELD EXPERIENCE
Credits: 4

The activities required for this course are aimed to meet the pedagogical needs of the middle level and the secondary science teacher. Emphasis is on content organization, teaching strategies, evaluation of existing curricular materials, literature research, and understanding the cognitive components of science learning, familiarity and competence with current teaching technology and current national and state standards. Additional emphasis will be placed on specific strategies for classroom management to aid the participants in becoming effective middle level and secondary classroom teachers. Department permission is required.

Pre-Requisites

Admission to the Teacher Education Program. Offered fall semesters.

ED-375. MIDDLE LEVEL AND SECONDARY EDUCATION METHODS WITH FIELD EXPERIENCE
Credits: 4

This course will address the educational perspectives that pertain to middle level (grades 4-8) and secondary (grades 7-12) instructional methodologies, curriculum, and classroom management, including strategies for transition, inclusion, and differentiation as recommended by the National Middle School Association and the Pennsylvania Department of Education. A 40-hour practicum is required. Departmental permission is required.

Pre-Requisites

Admission to the Teacher Education Program. Offered spring semesters.

ED-380. CONTENT AREA LITERACY
Credits: 3

This course is designed to provide literacy instruction theory and skills for teaching content area subjects in grades 4 through 12. The course's strategy-based approach includes developing vocabulary, evaluating reading materials, constructing meaning in texts, developing comprehension skills, and learning techniques for the adaptation and development of study materials to address the diverse reading levels of students in middle level and secondary schools.

Pre-Requisites

Admission to the Teacher Education Program. Offered fall semesters.

ED-381. TEACHING METHODS IN SOCIAL STUDIES
Credits: 4
Terms Offered: Fall

This course provides a study of instructional methodology in the concentration area of Social Studies at the middle and secondary level with a 40-hour field practicum. Departmental permission is required.

Pre-Requisites

Admission to the Teacher Education Program. Offered fall semesters.

ED-385. CLASSROOM MANAGEMENT
Credits: 3

This course is designed for students to establish and maintain a positive social context for learning in Pre-K through grade 4 education by applying developmentally appropriate motivational and management strategies. Researchers and theories will be identified, analyzed, evaluated, and demonstrated.

Pre-Requisites

Admission to the Teacher Education Program. Offered fall and spring semesters.

ED-390. STUDENT TEACHING WITH SEMINAR [PK-4], [4-8], [7-12], AND [K-12] (OPO COURSE)
Credits: twelve

Student teaching is the capstone learning experience for prospective teachers. Student teachers are assigned to work with experienced classroom teachers. Under supervision, they assume responsibility for teaching and for managing a classroom. Conferences are regularly scheduled with cooperating teachers and college supervisors. In addition to fieldwork, students attend regularly scheduled seminars designed to facilitate the integration of theory and practice. As part of the seminar experience, the student teachers receive workshop training in areas such as classroom management strategies and techniques, health and emergency guidelines, legal, ethical, and professional issues, and in career and certification procedures. In addition, the Gardner's Issues in Education Forum Series offers candidates workshops and lectures based on current topics in teaching and learning. Departmental permission is required.
Click here for course fees.

Pre-Requisites

Admission to the Teacher Education Program, and completion of all ED course requirements. Co-requisite will be completed in conjunction with [[EDSP-388]]. Offered fall and spring semesters.

EDSP. EDUCATION: SPECIAL EDUCATION

EDSP-210. TEACHING STUDENTS WITH SPECIAL NEEDS (FORMERLY ED 210)
Terms Offered: Fall,Spring

This course is designed to enable pre-service teachers to develop the knowledge base and instructional skills necessary to meet the educational needs of students with special needs in the classroom. This course is designed to familiarize pre-service teachers with varied exceptionalities, including behavioral disorders, learning disabilities, mental retardation, Attention-Deficit-Hyperactivity-Disorder, and physical and sensory disabilities. The course will incorporate useful pedagogical information that addresses the learning abilities of exceptional students and enhances instruction across all subject areas.

Pre-Requisites

[[ED-190]].

EDSP-225. TEACHING STUDENTS WITH HIGH INCIDENCE DISABILITIES WITH FIELD EXPERIENCE
Credits: 3
Terms Offered: Fall,Spring

This 3-credit course is designed to address the development, implementation, and monitoring of individualized management, instruction, curricular, and environmental strategies and adaptations for students with special needs. Emphasis is placed on a needs-based model incorporating the cognitive, language, attentional, affective, physical, and sensory needs of higher incidence populations within a variety of settings. A field experience component facilitates direct interaction with learners with special needs, supplemented by cooperative discussions of experiential application to course content. Course experiences and assignments are differentiated to support the candidate's certification area. Cross-list [[EDSP-501]]

Pre-Requisites

[[ED-190]], [[EDSP-210]].

EDSP-226. TEACHING STUDENTS WITH LOW INCIDENCE DISABILITIES WITH FIELD EXPERIENCE
Credits: 3
Terms Offered: Fall,Summer

This 3-credit course addresses the development, implementation, and monitoring of individualized management, instructional, curricular, and environmental strategies, and adaptations for students with special needs. Emphasis is placed on a needs-based model incorporating the cognitive, language, attentional, affective, physical, and sensory needs of lower incidence populations (multiple disabilities, hearing/vision impairments, orthopedic and health conditions) and pervasive development disorders/autism within a variety of settings. A field experience component facilitates direct interaction with learners with special needs, supplemented by cooperative discussions of experiential applications to course content. [[EDSP-502]]

Pre-Requisites

[[ED-190]] and [[EDSP-210]].

EDSP-227. BEHAVIOR INTERVENTION AND SUPPORT WITH FIELD EXPERIENCE
Credits: 3
Terms Offered: Spring

This course will present a working framework of assessment and social, behavioral, environmental, individualized, and collective management techniques for students with behavioral challenges. Techniques practiced in the course will focus on approaches for classroom organization, constructive discipline, and proactive responses to intervention, including applied behavioral analysis and functional behavioral assessments. A 20-hour field experience component facilitates direct interaction with learners with special needs, supplemented by cooperative discussions of experiential applications to course content. Cross-list[[EDSP-503]]

Pre-Requisites

[[ED-190]], [[EDSP-210]].

EDSP-250. HEALTH, PE, ADAPTED PHYS. ED, & SAFETY
Credits: 3

This three-credit course is a study of the methods and materials appropriate for teaching health, physical education, adapted physical education, and safety. Emphasis is on understanding the typical and atypical developmental levels, needs and interests of children in these areas from infancy to early adolescence.

EDSP-263. INFANTS, TODDLERS, AND YOUNG CHILDREN WITH SPECIAL NEEDS
Credits: 3

This course focuses on birth and early intervention services as well as special education in PK-12 systems. Educational policies, programs, practices, and services for infants, toddlers, and young children with delays or disabilities are the focus of this class. The course covers historical and legal perspectives, family systems theory, evidence-based interventions and services, theoretical foundations, assessment, curriculum, and current issues and challenges in early childhood special education. 30-hour field experience is required.

EDSP-300. SPECIAL EDUCATION ASSESSMENT AND EVALUATION
Credits: 3
Terms Offered: Spring,Summer

This three-credit course will provide direct experience with selecting, administering, and interpreting formal and informal assessment measures for analysis of student learning profiles. Assessments will include ecological inventories, norm-referenced, performance-based and curriculum-based testing, standardized achievement and intelligence measures, and vocational/transition-related evaluations. Cooperative discussions and use of case studies will focus on instructional decision-making based upon student learning profiles. Departmental permission is required.

Pre-Requisites

Admission to the Teacher Education Program.

EDSP-302. SECONDARY TRANSITION IN SPECIAL EDUCATION
Credits: 3
Terms Offered: Fall

This course focuses on models of effective, research-based special education teaching practices in literacy and content areas as well as universal design and differentiation for students with diverse needs and disabilities in a variety of academic settings. Emphasis will be placed on language, literacy, technologies, and transition processes.

Pre-Requisites

Admission to the Teacher Education Program.

EDSP-319. PRINCIPLES OF LAW AND SPECIAL EDUCATION LAW
Credits: 3

This course is a presentation of special education law within the context of overall school law. It will present the Federal and State legal basis of educational practices for students with disabilities and demonstrate the practical and effective implementation of the law.

EDSP-363. FAMILY, SCHOOL, & COMMUNITY
Credits: 3

This course focuses on current research and best practices in developing skills, techniques, and attitudes needed to form successful collaboration with diverse family systems and communities in an early childhood education setting.

EDSP-388. INCLUSIONARY PRACTICES
Credits: 3
Terms Offered: Fall,Spring

This course is designed for student teachers in [[ED-390]] to apply knowledge of accommodations and adaptations for students with disabilities in an inclusive academic setting. Emphasis will be placed on literacy and cognitive skill development for students with various exceptionalities.

Pre-Requisites

Admission to the Teacher Education Program. Co-requisite will be completed in conjunction with [[ED-390]].

EE. ELECTRICAL ENGINEERING

EE-140. SCIENTIFIC PROGRAMMING
Credits: 3

This course presents an introduction to computer programming with an emphasis on the techniques needed for data analysis and numerical problem solving for scientific and engineering applications. Basic programming idioms are presented including control structures, data types, methods for handling input and output as well as numerical methods such as array computing and vectorization. Emphasis is placed on proper software engineering practice as well as data analysis and presentation. Two hours of lecture and two hours of lab per week.
Click here for course fees.

Pre-Requisites

Or Concurrent [[MTH-100]] or [[MTH-111]]

EE-211. ELECTRICAL CIRCUITS AND DEVICES
Credits: 3

Basic DC and sinusoidal AC analysis of circuits. Introductory principles of electronic circuits, operational amplifiers, filters, digital logic, energy conversion devices, and energy conversion schemes.

Co-Requisites

[[EE-283]] and [[MTH-112]] **Or Concurrent**

EE-216. CIRCUIT ANALYSIS I
Credits: 3

Analysis of dc and sinusoidal ac circuits and power calculations. Network theorems. 2-hour lecture and 2-hour lab per week.
Click here for course fee.

Pre-Requisites

Or Concurrent [[MTH-111]]

EE-217. CIRCUIT ANALYSIS II
Credits: 3

Three-phase circuits, mutually coupled circuits, filter circuits, transient circuits, two-port parameters. Introduction to electronic circuits.

Pre-Requisites

[[MTH-112]] or Concurrent and [[EE-216]] or [[EE-211]]

EE-222. MECHATRONICS
Credits: 3

Electronic design automation for mechatronics system design, test, debug, control, and monitor; Sensor conditioning and digital conversion; Introduction to embedded software, sensor integration and modeling. Two hours of lecture and 3-hour lab per week.
Click here for course fee.

Pre-Requisites

[[EE-140]], [[EE-217]], [[EE-285]], [[PHY-202]]

EE-241. DIGITAL DESIGN
Credits: 4

Boolean Algebra. Numbering Systems. Combinational logic design and minimization. Sequential system fundamentals, state machine and programmable logic. Three hours of lectures and one two-hour lab per week.
Click here for course fees.

Pre-Requisites

[[EE-283]] or [[EE-285]]

EE-247. PROGRAMMING FOR EMBEDDED APPLICATIONS
Credits: 3

Microcontroller hardware structures. Basic software concepts such as constants, variables, control structures and subroutine calls, based on the 'C' language and as translated to machine language. Mapping of compiled software to the memory of a microcontroller. Embedded programming principles. Basic interactions with peripherals. Interrupts and their use. Debugging. Three hours of lecture and lab per week.

Click here for course fee.

Pre-Requisites

[[EE-140]] or [[CS-125]].

EE-251. ELECTRONICS I
Credits: 3

Circuit concepts involving nonideal components, particularly diodes, bipolar transistors, and MOS transistors. Bias, load line and signal amplification principles. Analysis and design of power supply and amplifier circuits, including power amplifiers. Simulation of circuits for design and analysis.

Pre-Requisites

[[EE-211]] or [[EE-216]]

EE-252. ELECTRONICS II
Credits: 4

Analysis and design of analog integrated circuits at the transistor level. Single-stage, multistage amplifiers, and cascode stage; differential amplifier analysis; operational amplifiers & applications; feedback structures, output stages, and power amplifiers. Three hours of lecture and 3-hour lab per week.
Click here for course fees.

Pre-Requisites

[[EE-251]], [[MTH-112]], [[PHY-202]]

EE-271. SEMICONDUCTOR DEVICES
Credits: 4

Basic properties of semiconductors and their conduction processes, with special emphasis on silicon and gallium arsenide. Physics and characterizations of p-n junctions.. Homojunction and heterojunction bipolar transistors. Unipolar devices including MOS capacitor and MOSFET. Microwave and photonic devices. Three hours of lecture and one two-hour lab per week.
Click here for course fees.

Pre-Requisites

[[CHM-117]], [[CHM-118]], [[PHY-202]], [[MTH211]]

EE-283. ELECTRICAL ENGINEERING LAB
Credits: 1

Exercises on DC and AC circuits, resonant and filter circuits, operational amplifiers, and digital logic circuits. One two-hour lab per week.
Click here for course fees.

Co-Requisites

Or Concurrent [[EE-211]]

EE-285. ELECTRICAL CIRCUITS LAB
Credits: 1

Exercises on DC and AC circuits, three-phase circuits, operational amplifiers, resonant and filter circuits, and basic electronic circuits. One two-hour lab per week.
Click here for course fees.

Pre-Requisites

Or Concurrent [[EE-217]]

EE-298. TOPICS IN ELECTRICAL ENGINEERING
Credits: 1-3

Selected topics in the field of electrical engineering. Requirements: Sophomore standing and permission of the instructor.
Click here for course fee for lab courses.

Pre-Requisites

Sophomore standing and permission of the instructor.

EE-314. CONTROL SYSTEMS
Credits: 3

Laplace transforms and matrices. Mathematical modeling of physical systems. Block diagram and signal flow graph representation. Time-domain performance specifications. Stability analysis, Routh-Hurwitz criterion. Steady state error analysis. Root-locus and frequency response techniques. Design and compensation of feedback systems. Introductory state space analysis. Two hours of lecture and one two-hour laboratory per week.
Click here for course fees.

Pre-Requisites

[[PHY-214]] and [[EE-217]] (or [[EE-211]])

EE-325. ENERGY CONVERSION DEVICES
Credits: 3

Magnetic circuit calculations. Principle of operation and applications of transformers, DC machines, synchronous machines, and induction motors. Applications of power electronics. Energy conversion schemes.

Pre-Requisites

[[EE-251]] and [[EE-217]]

EE-337. ENGINEERING ELECTROMAGNETICS I
Credits: 3

Waves and phasors; concepts of flux and fields; transmission line, Smith chart, and impedance matching; vector calculus; Maxwell's equations for electrostatic and magnetostatic fields.
Click here for course fees.

Pre-Requisites

[[MTH211]], [[MTH212]], [[PHY-202]].

EE-339. ENGINEERING ELECTROMAGNETICS II
Credits: 4

Obtain an understanding of Maxwell's equations and be able to apply them to solving practical electromagnetic field problems. Fundamental concepts covered will include laws governing electrodynamics, plane wave propagation in different media, power flow, polarization, transmission and reflection at an interface, microwave networks, waveguides, radiation, and antennas. Experiment and computer simulation based laboratories are used to reinforce the course material. Three hours of lecture and one three-hour lab per week.

Click here for course fee.

Pre-Requisites

[[EE-337]].

EE-342. EMBEDDED SYSTEM DESIGN
Credits: 3

Principles of embedded computing systems: architecture, hardware/software components, interfacing, hardware/software co-design, and communication issues. Three hours of lecture and project per week.

Click here for course fee.

Pre-Requisites

Or Concurrent
[[EE-222]], [[EE-241]], [[EE-247]] or [[CS-126]]

EE-345. COMPUTER ORGANIZATION
Credits: 3

Computer architecture and design, CPU, memory system, cache, data, input/output devices, bus architecture and control units. Processor types, instruction set and assembly language programming. Three hours of lecture and project per week.
Clicl here for course fees.

Pre-Requisites

[[EE-140]] or [[CS-125]], [[EE-222]], [[EE-241]].

EE-381. MICROFABRICATION LAB
Credits: 3

The theoretical and practical aspects of techniques utilized in the fabrication of bipolar junction transistors (BJTs). Includes crystal characteristics, wafer cleaning, oxidation, lithography, etching, deposition, diffusion, metallization, process metrics, and device characterization. One-and-a-half hour lecture and one three-hour lab per week.

Click here for course fee.

Pre-Requisites

Or Concurrent [[EE-271]], [[EE-251]]

EE-382. MODERN COMMUNICATION SYSTEMS
Credits: 4

Fundamentals of analog and digital modulation, modeling random signals and noise in communication systems, and elements of digital receivers. Laboratory exercises provide hands-on experience with circuits and measurement instruments as well as an introduction to communication system simulation. Three hours of lecture and 3-hour lab per week.
Click here for course fee.

Pre-Requisites

[[EE-252]], [[PHY-214]], [[MTH-212]]

EE-391. SENIOR PROJECTS I
Credits: 1

Design and development of selected projects in the field of electrical engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper and detailed progress report are required.Requirement: Senior standing in engineering.
Click here for course fees.

Pre-Requisites

[[PHY-202]], [[EE-241]], [[EE-222]], [[EE-252]], [[EE-271]], [[PHY-214]], [[EGM-320]]

Co-Requisites

Concurrent or after [[EE-381]], [[EE-314]], [[EE-325]], [[EE-337]]

EE-392. SENIOR PROJECTS II
Credits: 2

Design and development of selected projects in the field of selected projects in the field of electrical engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. This is a continuation of the [[EE-391]]. A professional paper to be presented and discussed in an open forum is required.
Click here for course fees.

Pre-Requisites

[[EE-391]].

EE-398. TOPICS IN ELECTRICAL ENGINEERING
Credits: 3

Requirement: Junior standing in engineering.
Click here for course fees.

EE-399. COOPERATIVE EDUCATION-ELECTRICAL ENGINEERING
Credits: 0-6

Professional cooperative education placement in a private or public enterprise related to the student's academic objectives and career goals. In addition to their work experiences, students are required to submit weekly reaction papers, have discussions with the Faculty Coordinator in the student's discipline on a periodic basis, prepare a final report and prepare and give a presentation to the Faculty Coordinator on an academic project completed at the enterprise. The co-op option for credit can only be taken one time for up to 6 credits, depending on the quantity of work hours, the complexity of the work and report and presentation requirements.

Pre-Requisites

Junior standing in engineering and Faculty Coordinator approval required.

EGY. ENERGY STUDIES

EGY-105. INTRODUCTION TO ENERGY
Credits: 3

This course discusses energy issues from a number of perspectives, including its physical and biological basis, heat transformation and space heating, energy audits, history, policy, economics, and presentation in the fine arts. The benefits and drawbacks of each type of fossil fuel and major form of alternative energy will be discussed, along with transmission and utilization patterns.
Click here for course fee.

EGY-202. ENVIRONMENTAL IMPACTS OF ENERGY DEVELOPMENT
Credits: 3

This course will understand the often-complex environmental issues associated with development, transport, and utilization of different forms of energy. The primary focus will be on impacts to land, water, and air caused by individual energy sources. Students will understand the scientific basis behind those impacts, procedures for measuring them, and attempts for amelioration / reclamation.
Click here for course fee.

Pre-Requisites

[[EGY-105]]

EGY-204. DATA MINING, GEOSPATIAL ANALYSIS, AND REMOTE SENSING: METHODS TO ASSESS ENERGY DEVELOPMENT
Credits: 3

This course will encompass a “hands-on” approach to data mining, geospatial analysis, and remote sensing data on land use and land cover relative to assessing the ecological footprint and impact of several energy technologies and related operations in our region.
Click here for course fee.

Pre-Requisites

[[EGY-105]], [[EES-272]], [[MTH-150]] or permission of instructor.

EGY-205. SOLID EARTH ENERGY AND MINERAL RESOURCES
Credits: 3

This course aims to improve literacy about earth’s energy and mineral resources—the materials that form much of the foundation of modern life. As the demand for energy and mineral resources continues to increase, so does the need for informed decision-making in the search, extraction, use and management of these critical resources. Achievement of a deeper understanding of where these resources come from and how they are used will help students navigate the resource challenges in their future.
Click here for course fee.

Pre-Requisites

[[EGY-105]] or instructor permission

EGY-211. INTRODUCTION TO ENERGY POLICY
Credits: 3

This course is a survey of energy policy that focuses mainly on the US with occasional references to global or international policies where appropriate. Energy, as used in this course, encompasses all forms: renewable and fossil fuels. We will examine how energy policies emerge, and the forces that both support and oppose efforts to generate energy or extract different types of fossil fuels. This requires some basic knowledge of the American political system and the policy making process. As important as the formal governmental system is to the policy process, the informal or extra-governmental actors, systems, and processes are equally critical. We will review the history of energy development internationally and domestically to understand how technological changes affect energy production, policy and the public’s perception and use of energy.
Click here for course fee.

EGY-212. THE DEVELOPMENT AND TRANSFORMATION OF THE INTERNATIONAL OIL INDUSTRY
Credits: 3

The development and transformation of the international oil industry is one of the great vehicles for studying the intertwining web of empire, business, international rivalry and environmental concern. Spreading from its roots in the United States, the oil industry circled the globe in search of the petroleum with which to power the economies of the developed world. But what initially began as a story of Western dominance over the developing world was transformed through the growth of political and resource nationalism. This occurred as the developed economies became increasingly ‘addicted to oil’ and made the quest for secure sources of supply a political and diplomatic necessity. This course will trace this evolution and study the impact it had on decolonization, Cold War politics, consumer culture and the globalization of business.
Click here for course fee.

EGY-213. COMMUNICATING ENERGY ISSUES
Credits: 3

This course offers a skills-focused and theoretical approach to communicating energy issues from rhetorical, journalistic and public relations standpoints. Through a variety of readings, discussions and practical workshops, students will learn how to access energy information, critically analyze its content and convey that information to the public. Students will also explore, through case studies, past energy campaign success and failures and learn the basics to creating their own messages.
Click here for course fee.

EGY-221. THE BUSINESS OF ENERGY
Credits: 3

This is a survey course that examines the business side of the much broader field of energy studies. Topics include the economics and economic impact of energy; the regulatory landscape for the energy industry; energy markets and managing the energy value chain and industry structure; and marketing and serving energy customers. Students will engage these topics through readings, research, interviews, and team projects.
Click here for course fee.

EGY-291. CAPSTONE COURSE IN ENERGY
Credits: 3

Students taking this course will work as an interdisciplinary team to address a specific energy-related issue that has scientific, policy, business, and communications dimensions. Students will be expected to conduct background research on the topic, and then perform appropriate analyses leading to deliverable product (e.g., report, design process) that will incorporate multiple perspectives.
Click here for course fee.

EGR. ENGINEERING

EGR-200. MATERIALS SCIENCE
Credits: 3

Application of materials properties to engineering design. Introduction to atomic arrangements, crystal structures, imperfection, phase diagrams, and structure-property relations. Fundamentals of iron, steel, and non-ferrous materials. The behavior of materials in environmental conditions.

Pre-Requisites

[[CHM-118]] or [[CHM-115]].

EGR-201. PROFESSIONALISM AND ETHICS
Credits: 1

Responsibility of an engineer as a professional; ethics in science and engineering; role of professional societies; recent trends in technological innovations; career planning. Review of professional exam. Requirement: Junior standing in engineering.

EGR-202. ENGINEERING PROFESSIONAL DEVELOPMENT I
Credits: 1

The subjects the student will learn and develop in this course are important in securing an internship, a spot in graduate school, or a professional position. This professional development course will allow the student to experience a variety of communicative activities that prepare a student to be an experienced, informed, and professional engineer. The student will be introduced to networking with professionals as well as provided with the ability to communicate skills to employers at job fairs or on-campus mentoring events. Emphasis will be placed on professional interactions as well as attendance at events and mastering the fundamentals of written resumes, cover letters, and creating professional profiles.

Pre-Requisites

Permission of the instructor.

EGR-203. ENGINEERING PROFESSIONAL DEVELOPMENT II
Credits: 1

Emphasis will be placed on development of enhanced interview skills with effective interview strategies. Students will attend professional panel interview discussions to engage with industry mentors. They will attend professional collaborations as well as campus hosted events such the Career and Intern Fair. Students will seek to master the essentials of job searches, written resumes, cover letters, elevator speeches, applying to grad schools, networking, and creating professional profiles on LinkedIn.

Pre-Requisites

Permission of the instructor.

EGR-219. INTRODUCTION TO WEAPONS SYSTEMS
Credits: 3

Introduction to military weapons and warfare, with a focus on how the modern period has resulted in greater complexity and the development of weapons systems. Basic principles of explosives, internal and exterior ballistics, calculation of probabilities of hit given randomness, fire control, guidance algorithms, radar and other sensors, detection and tracking, nuclear weapons and their effects.

Co-Requisites

[[PHY-202]] concurrent or before

EGR-222. MECHATRONICS
Credits: 3

Introduction to mechatronics system design with emphasis on using sensors to convert engineering system information into an electrical domain, signal conditioning and hardware integration, programming, and using actuators to effect system changes.
Click here for course fees.

Pre-Requisites

[[EE-211]], [[EE-283]], [[ME-140]] and [[PHY-202]]

EGR-391. SENIOR PROJECTS I
Credits: 1

Design and development of selected projects in the field of engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper and detailed progress report are required.
Click here for course fees.

Pre-Requisites

Senior standing in engineering

EGR-392. SENIOR PROJECTS II
Credits: 2

Design and development of selected projects in the field of engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. This is a continuation of [[EGR-391]]. A professional paper to be presented and discussed in an open forum is required.
Click here for course fees.

Pre-Requisites

[[EGR-391]]

EGR-399. COOPERATIVE EDUCATION
Credits: 0-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experiences, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. See the Cooperative Education section of this bulletin for placement procedures.
Requirements: Junior standing; minimum 2.0 cumulative GPA; consent of the academic advisor; and approval of placement by the department chairperson.

EGM. ENGINEERING MANAGEMENT

EGM-310. PROJECT DECISION PROCESSES
Credits: 3

An Introduction to Economic Decisions processes and techniques relating to technical processes and projects. This course will show how to properly define economic decision parameters and make project decisions based on economic guidelines such as revenue, cost and product or process performance. Concepts of engineering economy are reviewed briefly with respect to estimated value, projected cash flow, and risk associated with engineering projects.

Pre-Requisites

[[EGM-320]] or instructor permission.

EGM-315. QUALITY MANAGEMENT
Credits: 3

This course provides students with an overview of important topics relating to Quality Assurance systems and processes directly related to engineering functions. Topics range from voice of the customer to the history and application of TQM. Cornerstone features include coverage of topics essential to any industry: customer focus creation, value creation, leadership, process improvement and management, strategic planning, measures of performance, supply chain management, human resources management, knowledge and information management, project management and business process.

Pre-Requisites

[[EGM-320]] or instructor permission.

EGM-320. ENGINEERING PROJECT MANAGEMENT
Credits: 3

Project management and evaluation based on economic considerations, project selection models, and fundamentals of project planning are covered. Specific topics include Work Breakdown Structure (WBS), Organizational Breakdown Structure (OBS), Earned Value Analysis (EVA), risk and opportunity analysis, project scheduling, and other project analysis techniques.

Pre-Requisites

[[MTH-111]] or instructor permission.

EGM-321. QUANTITATIVE ANALYSIS
Credits: 3

Discussion of various quantitative analysis and optimization methodologies. Analytical numerical approaches are used in solving linear and nonlinear optimization problems. Emphasizes the development of ability in analyzing problems, solving problems by using software, and post solution analysis.

Pre-Requisites

Instructor permission.

EGM-322. OPERATIONS ANALYSIS
Credits: 3

Introduction to Operations Analysis and Resource Allocation offers topics relating to technical processes and projects required in engineering, manufacturing, and service-related industrial applications. The course covers those engineering subjects from forecasting analysis methods to manufacturing line balancing, queuing, and operation locations selections. Students will model and assess production flows and asset utilization for purposes of reducing production bottlenecks while maintaining/increasing facility utilization.

Pre-Requisites

[[EGM-320]] or instructor permission.

EGM-325. PROJECT ANALYSIS
Credits: 3

This course offers experience in managing a project. Topics relating to project planning, costing, resources, and critical path and other analyses relating to manufacturing, research, and service-related industrial applications are discussed. The course covers engineering subjects from project definition and planning methods to earned value planning and analysis.

Pre-Requisites

[[EGM-320]] or instructor permission.

EGM-336. ENGINEERING AND MANAGEMENT MODELS
Credits: 3

Discussion of the techniques in and the art of modeling practical problems encountered by engineers and managers.

Pre-Requisites

Instructor permission.

EGM-340. SIX SIGMA & LEAN MANUFACTURING
Credits: 3

This course focuses on developing the knowledge and skills of a typical industry-based Six Sigma Green Belt candidate. The course includes the descriptive statistics and project management skills necessary to Define, Measure, Analyze, Improve and Control processes. Lecture topics include Six Sigma problem-solving techniques, continuous improvement, mistake proofing, Lean Six Sigma, Lean manufacturing, determining the cost of quality and more.

Pre-Requisites

Instructor permission.

EGM-391. SENIOR PROJECTS I
Credits: 1

Design and development of selected projects in the various fields of engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A detailed progress report is required.

Click here for course fee.

Pre-Requisites

Senior standing in Engineering Management or departmental permission.

EGM-392. SENIOR PROJECTS II
Credits: 2

Design and development of selected projects in the field of engineering management under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper to be presented and discussed in an open forum is required.

Click here for course fee.

Pre-Requisites

[[EGM-391]]

EGM-399. COOPERATIVE EDUCATION
Credits: 0-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experiences, students are required to submit biweekly reports, a final report, and present to an audience of peers and faculty. The co-op option for credit can only be taken one time for either 3 or 6 credits.

Pre-Requisites

Instructor permission.

ENG. ENGLISH

ENG-098. ACADEMIC WRITING
Credits: 3

Intensive practice in grammar, syntax, vocabulary, reading and writing.

ENG-101. COMPOSITION
Credits: 4

Practice in writing for specific purposes and audiences to develop a coherent voice for engaging in academic and professional discourse; practice in writing with the support of digital technology; study of primary texts, models, and principles of expository and argumentative writing to develop critical reading, writing, and thinking skills; introductory bibliographic instruction and practice in writing that incorporates library research.

ENG-120. INTRODUCTION TO LITERATURE AND CULTURE
Credits: 3

An introduction to literature through critical reading, writing, and discussion of the major forms of literary and cultural expression. Students will explore works in various literary traditions and engage in a deep consideration of the diversity of human experience and identities. Major subtopic areas for the course will include: Reading Classical Traditions; Reading Great Works; Reading Cultural Crossroads; and Reading American Experience. Reading Classical Traditions: A study of major works from the ancient world to the Renaissance, emphasizing the impact these texts have had on our literary tradition and our culture. Reading Great Works: A study of major works since the Renaissance, emphasizing the principal modes of literary expression (poetry, drama, fiction and film). Reading Cultural Crossroads: A study of works emphasizing a variety of cultural values, intercultural relationships, global perspectives, and aesthetic experiences. Reading American Experience: A study of works from American literature, emphasizing the multicultural heritage and nature of American writers and cultures.

Pre-Requisites

[[ENG-101]].

ENG-190. PROJECTS IN WRITING AND EDITING
Credits: 1-3

Independent projects in writing, editing, publication design and layout, and peer consulting connected to the English program newsletter (ENG 190 A – Inkwell Quarterly), the student literary magazine (ENG 190 B – Manuscript), the University Writing Center (ENG 190 C – Writing Methods), and our annual best essays publication (ENG 190 D - Kirby Canon).

ENG-201. WRITING ABOUT LITERATURE AND CULTURE
Credits: 4

An introduction to conventions, theoretical approaches, research methods, and practice of literary and cultural studies. Application of contemporary critical perspectives and research methodology in reading and writing about literary and cultural texts.

Pre-Requisites

[[ENG-101]].

ENG-202. TECHNICAL AND PROFESSIONAL WRITING
Credits: 3

Practice in "real world writing." Students write on subjects associated with their major or intended careers. Students learn to perform as self-aware writers who have something to say to someone, to adapt their roles and voices to various audiences, and to marshal and present persuasively data that is relevant to a particular purpose and context.

Pre-Requisites

[[ENG-101]].

ENG-203. INTRODUCTION TO CREATIVE WRITING
Credits: 3

The analysis and practice of various forms of creative writing including the study of the writer's tools and choices in creating poetry, short fiction, and dramatic scenes.

Pre-Requisites

[[ENG-101]].

ENG-222. INTRODUCTION TO DIGITAL HUMANITIES
Credits: 3

An introduction to the field of Digital Humanities with an emphasis on how digital processes and products impact the development and study of literature, language, and the disciplines of the humanities.

ENG-225. COMPARATIVE GRAMMAR
Credits: 3

A comparative and critical study of prescriptive, descriptive and transformational-generative grammar.

Pre-Requisites

[[ENG-101]].

ENG-228. PROFESSIONAL AND WORKPLACE WRITING
Credits: 3

The study and practice of effective writing techniques related to writing at work for the professional world that focuses on producing polished documents, enhancing research techniques, and fine-tuning oral communication skills.

Pre-Requisites

[[ENG-101]].

ENG-233. SURVEY OF ENGLISH LITERATURE I
Credits: 3

A study of the major works and movements in English literature from the Anglo-Saxon period through the eighteenth century.

Pre-Requisites

[[ENG-101]].

ENG-234. SURVEY OF ENGLISH LITERATURE II
Credits: 3

A study of the major works and movements in English literature from the Romantic movement to the present.

Pre-Requisites

[[ENG-101]].

ENG-281. SURVEY OF AMERICAN LITERATURE I
Credits: 3

A study of writers, works, and movements in the Americas from the 1490s to the Civil War.

Pre-Requisites

[[ENG-101]].

ENG-282. SURVEY OF AMERICAN LITERATURE II
Credits: 3

A study of major American writers, works, and movements from the Civil War to the present.

Pre-Requisites

[[ENG-101]].

ENG-303. ADVANCED WORKSHOP IN CREATIVE WRITING
Credits: 3
Terms Offered: Fall

A seminar experience where students write and critique poetry, fiction, nonfiction, or scripts. Specific genre designated in each course.

Pre-Requisites

[[ENG-203]] or permission of instructor.

ENG-308. RHETORICAL ANALYSIS AND NONFICTIONAL PROSE WRITING
Credits: 3

The study and practice of strategies for producing responsibly written public information, including persuasive and argumentative propositions for particular audiences.

Pre-Requisites

[[ENG-101]].

ENG-311. TECHNOLOGIES OF THE BOOK
Credits: 3

A study in the production, evolution, and circulation of the book as a material form, from its inception through the digital age, with an emphasis on textual criticism and bibliographic analysis.

Pre-Requisites

[[ENG-101]]

ENG-324. HISTORY OF THE ENGLISH LANGUAGE
Credits: 3

A chronological study of the origins of the English language and the systematic changes that have made it the language we speak and write today.

Pre-Requisites

[[ENG-101]].

ENG-331. STUDIES IN MEDIEVAL ENGLISH LITERATURE
Credits: 3

A study of Medieval literature to 1485, exclusive of Chaucer.

Pre-Requisites

[[ENG-101]].

ENG-333. STUDIES IN RENAISSANCE LITERATURE
Credits: 3

A study of Renaissance texts focused on literary, dramatic, and cultural works from 1485 to 1660.

Pre-Requisites

[[ENG-101]].

ENG-334. STUDIES IN EIGHTEENTH-CENTURY LITERATURE
Credits: 3

A study of eighteenth-century authors and culture from about 1660-1820.

Pre-Requisites

[[ENG-101]].

ENG-335. STUDIES IN ROMANTIC LITERATURE
Credits: 3

A study of major writers, works, and topics of the British Romantic Period.

Pre-Requisites

[[ENG-101]].

ENG-336. STUDIES IN VICTORIAN LITERATURE
Credits: 3

A study of major writers, works, and topics of the Victorian Age.

Pre-Requisites

[[ENG-101]].

ENG-337. STUDIES IN AMERICAN ROMANTIC LITERATURE
Credits: 3

A study of nineteenth-century American literature, including novels, essays, short fiction, and poetry.

Pre-Requisites

[[ENG-101]].

ENG-340. STUDIES IN CHAUCER
Credits: 3

A study of selected works by Chaucer.

Pre-Requisites

[[ENG-101]].

ENG-342. STUDIES IN SHAKESPEARE
Credits: 3

A study of selected plays and poems by Shakespeare.

Pre-Requisites

[[ENG-101]].

ENG-350. STUDIES IN THE ENGLISH NOVEL
Credits: 3

A study of the novel in English, excluding American writers.

Pre-Requisites

[[ENG-101]].

ENG-351. STUDIES IN POSTMODERNISM
Credits: 3

A study of postmodern writers from the 1960s to the present.

Pre-Requisites

[[ENG-101]].

ENG-352. STUDIES IN THE AMERICAN NOVEL
Credits: 3

A study of the American novel from its eighteenth-century beginnings to the present.

Pre-Requisites

[[ENG-101]].

ENG-353. STUDIES IN POSTCOLONIAL LITERATURE
Credits: 3

A study of literature emerging from the British empire and its former colonies with an emphasis on major issues within postcolonial studies.

Pre-Requisites

[[ENG-101]].

ENG-356. STUDIES IN AFRICAN AMERICAN LITERATURE
Credits: 3

A study of African American literature from the Antebellum era to the present.

Pre-Requisites

[[ENG-101]].

ENG-357. STUDIES IN GOTHIC LITERATURE
Credits: 3

A study of major writers, works, and topics of gothic literature from about 1764 to the present.

Pre-Requisites

[[ENG-101]].

ENG-358. STUDIES IN CONTEMPORARY FICTION
Credits: 3

A study of fiction, including the novel, short story, and novella, written since World War II. Works from English, American, and world literature may be included to reflect the diversity of contemporary literature and the emergence of post-modernist themes and forms.

Pre-Requisites

[[ENG-101]].

ENG-361. STUDIES IN MEDIEVAL AND RENAISSANCE DRAMA
Credits: 3

A study of drama from the tenth century to 1642; reading of plays by medieval and early modern dramatists exclusive of Shakespeare.

Pre-Requisites

[[ENG-101]].

ENG-365. STUDIES IN MODERN BRITISH DRAMA
Credits: 3

A study of major playwrights, works, and topics of modern British drama.

Pre-Requisites

[[ENG-101]].

ENG-366. STUDIES IN AMERICAN DRAMA
Credits: 3

A study of major playwrights, works, and movements in American drama.

Pre-Requisites

[[ENG-101]].

ENG-370. STUDIES IN MODERN BRITISH POETRY
Credits: 3

A study of major British poetry of the twentieth century.

Pre-Requisites

[[ENG-101]].

ENG-376. STUDIES IN MODERN AMERICAN POETRY
Credits: 3

A study of major movements and representative figures in American poetry from about 1900 to 1960.

Pre-Requisites

[[ENG-101]].

ENG-391. (ENG-392 SPRING) SENIOR PROJECTS: CAPSTONE
Credits: 1

An independent project in the area of the student's concentration culminating in a formal written and oral presentation. Advised by a member of the English department faculty, the project demonstrates the student's learning in the major.

Pre-Requisites

Open only to senior English majors.

ENG-393. THE TEACHING OF ENGLISH IN MIDDLE-LEVEL AND SECONDARY SCHOOLS
Credits: 4

A study of the theory and practice of teaching composition, literature, and English language studies in the middle and secondary school level (grades 7 through 12). Topics include planning, methodology, presentation, and assessment of lessons. The course includes 40 hours of field experience.

Pre-Requisites

Junior standing in English and admission to the Teacher Education Program.

ENG-395. (ENG-396 SPRING) INDEPENDENT RESEARCH
Credits: 1 - 3
Terms Offered: On Demand

Independent study and research for advanced students in the field of the major under the direction of a faculty member. A research paper at a level significantly beyond a term paper is required.

Pre-Requisites

Approval of department chair is required.

ENG-397. SEMINAR
Credits: 3

Presentations and discussions of selected topics.

ENG-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See the Cooperative Education section of this Bulletin for placement procedures.)

Pre-Requisites

Sophomore standing, minimum 2.0 cumulative GPA, consent of academic advisor, and approval of placement by the department chairperson.

ESL. ENGLISH AS A SECOND LANGUAGE

ESL-100. READING AND WRITING
Credits: 3

This course focuses on the connection between critical thinking and academic reading and writing skills necessary to analyze academic texts and produce collegiate level compositions. It emphasizes the utilization of reading comprehension strategies and writing process skills to respond to various readings and to develop vocabulary expansion. This course also requires a research paper which utilizes the basic formatting and referencing of sources using MLA style documentation.

ESL-102. LISTENING AND SPEAKING
Credits: 3

This course is a cohesive, integrated, and structured approach, to developing and expanding upon key listening and speaking skills of transitioning, English language learners (ELLs), as to ensure successful matriculation to a collegiate, academic environment. Therein, students will address defined, critical abilities, as a way in which to increase their capacities to engage in academic processes that include and demand superior listening and speaking skills within higher educational institutions and curricula.

ESL-103. TEST PREP
Credits: 3

This course has been designed to serve as an integrated and structured approach to providing and expanding upon critical test preparation strategies and study skills for transitioning, English language learners (ELLs), as to ensure successful matriculation to a collegiate, academic environment. Utilizing a multifaceted configuration of classroom instruction and independent, online study, students will be provided with extensive practice of the most key academic skills and methodologies, as a way in which to increase their capacities to engage in academic processes that include and demand a superior skill set within higher educational institutions and curricula.

ENT. ENTREPRENEURSHIP

ENT-151. INTEGRATED MANAGEMENT EXPERIENCE I
Credits: 3
Terms Offered: Fall

Integrated Management Experience is a two-semester sequence that takes you through the entrepreneurial process from creating a business concept to planning the venture to launching and operating the business to harvest and closure of the firm. You learn how businesses plan and operate through the study of functional areas such as marketing, management, human resources, accounting and finance, and operations. Most importantly, you will learn and experience how the pieces fit together through integrating the functional areas tracking information and performance using financial accounting principles. Cross listed with [[ACC-151]] and [[BA-151]]

ENT-152. INTEGRATED MANAGEMENT EXPERIENCE II
Credits: 3
Terms Offered: Spring

Integrated Management Experience is a two-semester sequence that takes you through the entrepreneurial process from creating a business concept to planning the venture to launching and operating the business to harvest and closure of the firm. You learn how businesses plan and operate through the study of functional areas such as marketing, management, human resources, accounting and finance, and operations. You develop a clear understanding of the importance of accounting cycles and how financial accounting principles provide not only information but an integrating thread for all types of organizations. Cross listed with [[ACC-152]] and [[BA-152]]

Pre-Requisites

[[ACC-151]] / [[BA-151]] / [[ENT-151]] with a minimum GPA of 2.0.

ENT-201. NATURE AND ESSENCE OF ENTREPRENEURSHIP
Credits: 3
Terms Offered: Fall

An introduction to entrepreneurs and self-career creation in small and large entrepreneurial organizations. The importance of entrepreneurs in the local, national, and world economies and personal characteristics of successful entrepreneurs will be studied. Guest speakers and a case study are included.

Pre-Requisites

[[ENT-152]] or [[BA-153]] with a minimum GPA of 2.0.

ENT-203. OPPORTUNITY IDENTIFICATION: INNOVATION AND CREATIVITY
Credits: 3
Terms Offered: Fall

An introduction to the creative and innovative processes. Emphasis on forms of creativity and how they are interrelated, psychology and behavioral aspects of creativity, recognizing creativity, and the practice of managing innovation and creativity in different environments. Direct experience with two or more forms of creativity.

ENT-252. THE ENTREPRENEURIAL LEADER
Credits: 3
Terms Offered: Spring

Examines leadership characteristics and behaviors of entrepreneurs. Emphasis on authentic and integrity-based leadership, role of emotional intelligence, and effective leadership strategies in entrepreneurial environments.

ENT-321. ANALYZING MARKETS AND COMPETITION
Credits: 3
Terms Offered: Fall

In-depth study of identification and assessment of markets and competition. Sources of information, key analytical techniques, and evaluation strategies are examined.

Pre-Requisites

[[MKT-221]] with a minimum GPA of 2.0.

ENT-342. ENTREPRENEURIAL FINANCE
Credits: 3
Terms Offered: Spring

The study of the financial dimensions of launching and growing ventures. Topics include financial characteristics and requirements of growth, venture capital, angel capital and private investment, equity markets and public offerings, and specialized funding programs.

Pre-Requisites

[[FIN-240]] with a minimum GPA of 2.0.

ENT-384. SMALL BUSINESS CONSULTANCY
Credits: 3
Terms Offered: Spring

Teams of students diagnose, analyze, and recommend solutions for problems defined by small business clients. Course requires students to apply a range of classroom skills in a real situation and present oral and written reports to the client firm. Requirements: Senior standing and permission of the instructor.

ENT-385. OPPORTUNITY ASSESSMENT: TECHNICAL, ECONOMIC AND MARKET FEASIBILITY
Credits: 3
Terms Offered: Spring

Theory and practice of assessing market, economic, and technical feasibility. Use of project management techniques to develop an in-depth feasibility analysis plan for expected outcomes.

ENT-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. See the Cooperative Education section of this bulletin for placement procedures. Requirements: Sophomore standing; minimum 2.0 cumulative GPA; consent of the academic advisor; and approval of placement by the department chairperson.

ENT-461. PRACTICING ENTREPRENEURSHIP
Credits: 3
Terms Offered: Fall

Advanced essentials and elements of becoming an entrepreneur, or intrapreneur, will be examined through current classic 'real life' entrepreneurial case readings and entrepreneur and guest faculty lectures. Students will create their own entrepreneurial enterprise as a team project.

Pre-Requisites

Senior standing, [[ENT-201]] with a minimum GPA of 2.0, or permission of the instructor.

ENT-462. ENTREPRENEURIAL INTERNSHIP
Credits: 3

The course content provides an on-the-job multi-discipline experience assisting a working local entrepreneur in the development and operation of a business enterprise.

ENV. ENVIRONMENTAL ENGINEERING

ENV-198/298/398. TOPICS IN ENV
Credits: Varies with topic

Selected topics in the field of engineering and related areas. The may include the following topics: mechanical engineering; civil engineering; engineering management; geotechnology; and radiation.
Click here for fee for courses with a lab.

Pre-Requisites

Permission of the instructor.

ENV-201. PROBABILITY AND STATISTICS FOR ENGINEERS
Credits: 2

This course provides an introduction to the central ideas of probability and statistics and their application in the analysis of engineering and environmental data including control charts and specification error. Sampling and data gathering techniques are also discussed. One hour of lecture and one hour of discussion per week.

Pre-Requisites

[[CHM-115]] or [[CHM-118]], [[MTH-111]], or instructor's permission

ENV-202. ENVIRONMENTAL ENGINEERING SYSTEMS: ANALYTICAL AND COMPUTATIONAL ANALYSIS
Credits: 2
Terms Offered: On Demand

This course focuses on basic methods for obtaining numerical solutions of algebraic and transcendental equations, simultaneous linear equations, and curve fitting techniques; examples provided are relevant to environmental engineering processes; will include an introduction to problem-solving using Excel and MATLAB. Two hours of lab per week.

Pre-Requisites

[[MTH-111]], [[MTH-112]] or instructor's permission.

ENV-205. ENVIRONMENTAL MICROBIOLOGY
Credits: 3

The foundation concepts in microbiology that are important in environmental systems will be explored in this course. This will include the function and formation of cellular components starting from basic molecules (carbohydrates, fatty acids, amino acids, nucleotides) to the cellular structures that are formed (membranes, proteins, and the nucleic acids RNA & DNA); carbon, energy, and nutrient sources required for cellular growth; and the metabolic pathways for substrates common in environmental systems will be shown. Biodegradation and growth kinetic models will be introduced. Global cycles of major elements (i.e. carbon, nitrogen, oxygen, phosphorus, etc.) will be explored.

ENV-305. SOLID WASTE MANAGEMENT
Credits: 3

Assessment of the scope of the solid waste problem and engineering and management strategies. Lecture topics include the following: solid waste sources; characterization and generation rates; collection and transportation technologies and management options; sanitary landfill design and operation; and recycling strategies and technologies. Three hours of lecture per week.

Pre-Requisites

[[EES-240]], [[CHM-116]] or [[ENV-201]] or instructor's permission.

ENV-315. SOILS
Credits: 3

Study of the structure, properties, and classification of soils. Fundamental concepts of soils science are applied to the environmental management of terrestrial ecosystems. Topics include soil genesis, the classification, and physical properties of soils, soil chemistry, and soil moisture relationships. Two hours of lecture and three hours of lab per week.
Click here for course fees.

Pre-Requisites

[[GEO-101]], [[CHM-116]] or [[ENV-201]].

ENV-321. HYDROLOGY
Credits: 3

A quantitative analysis of the physical elements and processes that constitute the hydrologic cycle. Topics include precipitation, infiltration, evaporation, runoff, streamflow, and ground water flow. Ground water modeling and advanced treatment of Darcy's Law is presented within the context of migration of ground water pollutants. Three hours of lecture per week.

Pre-Requisites

[[GEO-101]], [[MTH-111]], [[ENV-201]] or [[MTH-150]].

ENV-322. WATER RESOURCES ENGINEERING
Credits: 3

Design and development of selected projects in the various fields of engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A detailed progress report is required. Three hours of lecture per week.

Pre-Requisites

[[ENV-321]].

ENV-323. HYDROLOGY LAB
Credits: 1

Components of the hydrologic cycle are studied experimentally. Three hours of lab per week.

Co-Requisites

[[ENV-321]] concurrent or before.

ENV-330. WATER QUALITY
Credits: 4

The physical, chemical, and biological processes that affect the quality of water in the natural environment. The measurement of water quality parameters in water and wastes. The behavior of contaminants in ground and surface water. Three hours of lecture and three hours of lab per week. Click here for course fees.

Pre-Requisites

[[EES-240]], [[CHM-116]] or [[ENV-201]]

ENV-332. AIR QUALITY
Credits: 3

Study of atmospheric pollutants, their sources and effects; measurement and monitoring techniques for air pollutants; atmospheric chemical transformations; regulatory control of air pollution; meteorology of air pollution; transport and dispersion of air pollutants; and introduction to indoor air pollution. Lab work includes both problem-oriented and hands-on exercises. Exercises include basic gas concepts, volume measuring devices, flow, velocity, and pressure measuring devices, calibration of such devices, and various sampling techniques. Two hours of lecture and three hours of lab per week. Click here for course fees.

Pre-Requisites

[[EES-240]], [[CHM-116]] or [[ENV-201]].

ENV-352. HYDRAULIC ENGINEERING
Credits: 3

Water distribution, sewage collections, pipe network models, piping materials, pumps and pumping stations, valves and tanks. Design and operation. Three hours of lecture per week.

Pre-Requisites

[[ME-321]].

ENV-353. AIR POLLUTION CONTROL
Credits: 3

This course provides the philosophy and procedures for design of air pollution control systems. Methods used for controlling air-borne emissions of gases, aerosols, and organic vapors are covered. Designs are carried out based on data for typical systems. Evaluations of alternatives with cost comparisons are also presented. Three hours of lecture per week.

Pre-Requisites

[[ENV-332]] or [[ME-321]].

ENV-354. HAZARDOUS WASTE MANAGEMENT
Credits: 3

An overview and application of engineering principles to management of hazardous wastes and the remediation of contaminated sites. Introduction to regulatory compliance and environmental laws. Three hours of lecture per week.

Pre-Requisites

[[ENV-330]] or permission of the instructor.

ENV-356. PHYSICAL AND CHEMICAL TREATMENT PROCESSES
Credits: 3

Design of physical/chemical processes m aqueous treatment systems. Focus will be mostly on the drinking water treatment processes but industrial treatment processes will be included. Estimation of demand and sludge disposal also will be addressed. Three hours per week classroom instruction

Pre-Requisites

[[ENV-330]]

ENV-357. BIOLOGICAL TREATMENT PROCESSES
Credits: 3

Design of biological processes in aqueous treatment systems. Topics will include typical municipal wastewater treatment as well as industrial treatment processes. Generation of biogas will be addressed as well as sludge handling and disposal.

Pre-Requisites

[[ENV-330]]

ENV-373. OCCUPATIONAL HEALTH
Credits: 3

Appraisal of environmental health hazards, sampling techniques, instrumentation and analytic methods. Principles of substitution, enclosure, and isolation for the control of hazardous operations in industry. Three hours of lecture and demonstration per week. Requirement: Junior or senior standing in engineering.

ENV-390. JUNIOR SEMINAR
Credits: 1

Course will focus on project management, design concepts and constraints, literature review and preliminary data collection for senior projects course.

ENV-391. SENIOR PROJECTS I
Credits: 1

Design and development of selected projects in the various fields of engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper and detailed progress report are required.
Click here for course fees.

Pre-Requisites

Department permission

ENV-392. SENIOR PROJECTS II
Credits: 2

Design and development of selected projects in the field of engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. This is a continuation of [[ENV-391]]. A professional paper to be presented and discussed in an open forum is required.
Click here for course fees.

Pre-Requisites

[[ENV-391]].

ENV-395. AND 396. INDEPENDENT RESEARCH
Credits: Varies with topic1-3 credits.

Independent study or research for advanced students in the field of their major under the direction of a departmental faculty member.
Click here for course fees.

Pre-Requisites

Approval of department chair and academic advisor.

ENV-397. SEMINAR
Credits: 1-3

Presentations and discussions of selected topics and projects. Requirement: Senior standing in environmental engineering.

ENV-398. TOPICS
Credits: Varies with topic

Selected topics in the field of engineering and related areas. The may include the following topics: mechanical engineering; civil engineering; engineering management; geotechnology; and radiation.
Click here course fee.

Pre-Requisites

Permission of the instructor.

ENV-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experiences, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. See the Cooperative Education section of this bulletin for placement procedures.

Pre-Requisites

Sophomore standing; minimum 2.0 cumulative GPA; consent of the academic advisor; and approval of placement by the department chairperson.

FIN. FINANCE

FIN-201. PERSONAL FINANCE
Credits: 3
Terms Offered: On Demand

This course in personal financial management is designed to help students understand and develop competence and confidence in using the knowledge and skill of the discipline of personal money management. Students develop competence and confidence through reading about personal financial management and through working with problems and cases that include real life experiences with the subject. This course is designed to benefit business and non business majors.

FIN-219. FINANCIAL ANALYSIS
Credits: 3

This course is an introductory course on the fundamentals of financial analysis techniques. It aims to help students develop analytical skills for making investment decisions. Furthermore, it focuses on less well-established techniques and knowledge that is alien to and ignored by efficient market hypothesis (EMH) or modern portfolio theory (MPT). The emphasis is on: technical analysis, Microsoft Excel tools in a financial context and Bloomberg terminals.

Pre-Requisites

[[BA-119]], [[FIN-240]] with a minimum grade 2.0

FIN-230. MONEY & BANKING
Credits: 3

A study of money, credit, and banking operations. Monetary standards, development of the American monetary and banking system. Recent developments in other financial institutions. Central banking and the Federal Reserve System, instruments of monetary control, international monetary relationships. Cross-listed with [[EC-230]]

FIN-240. INTRODUCTION TO FINANCE
Credits: 3

This course introduces basic principles of finance including cash flow, financial ratios, time value of money, stock and bond valuation, capital structure and cost of capital.

FIN-319. FINANCIAL DERIVATIVES
Credits: 3

Financial securities and markets are changing rapidly. This course gives students an understanding of financial derivative instruments and their applications to corporate strategy and risk management. Students learn how the finance derivatives are priced and used in risk management and trading or speculative strategies by individuals and companies. We cover options, forwards, futures, and swaps to help our students to be better prepared to enter a career in finance.

Pre-Requisites

[[ACC-162]], [[BA-119]], [[FIN-240]], [[FIN-341]], [[FIN-343]] all with a minimum grade of 2.0

FIN-341. MANAGERIAL FINANCE
Credits: 3

This course provides advanced study of financial theories, decision-making models relating to: financial analysis and planning; working capital management; cash budgeting; capital asset acquisitions; capital asset financing; cost of capital; capital structuring; acquisitions; divestitures; and reorganizations.

Pre-Requisites

[[FIN-240]] with a minimum grade of 2.0

FIN-342. PROPERTY AND LIFE INSURANCE
Credits: 3

A study of principles of life, health, property, and liability insurance applied to the needs of individuals and organizations.

Pre-Requisites

[[FIN-341]] with a minimum grade of 2.0

FIN-343. INVESTMENTS AND PORTFOLIO MANAGEMENT
Credits: 3

A survey of the features and characteristics of investment instruments, the operation and regulation of security markets, the techniques of security analysis and valuation, financial intermediaries, and modern and traditional portfolio theory and management.

Pre-Requisites

[[FIN-240]] with a minimum grade of 2.0

FIN-345. LONG-RANGE FINANCIAL PLANNING
Credits: 3

A survey of the tools and techniques currently employed by financial decision-makers when evaluating organizational performance and developing future courses of action. Emphasis will be placed upon long-range planning and capital budgeting techniques.

Pre-Requisites

[[FIN-341]] and [[FIN-343]] with a minimum grade of 2.0

FIN-358. INTERNATIONAL FINANCE
Credits: 3

This course will provide the conceptual framework necessary for financial decision-making in a multinational corporation (mnc). We focus on implementing analytical tools and theory through problems and analysis of real-world global decision-making. Students explore the following traditional areas of corporate finance: investments, capital budgeting, cost of capital, capital structure, evaluation and control of operations, merger and acquisition, and risk management from a global perspective.

FIN-397. SEMINAR
Credits: 1-3

One to three credits

FIN-462. FINANCE INTERNSHIP
Credits: three or six

This internship course consists of professional business experience in which students apply their accumulated knowledge, skills and abilities in an organization related to the students' academic objectives and career goals. This course requires Cooperative Education approval as well as approval of the academic advisor, the department chair and the faculty advisor for the course.

Pre-Requisites

[[ACC-202]] with a minimum grade of 2.0

FYF. FIRST-YEAR FOUNDATIONS

FYF-101. FIRST-YEAR FOUNDATIONS
Credits: 3

The mission of the First-Year Foundations Program is to provide rigorous learning experiences that challenge first-year students to develop the strategies essential for a successful transition into the Wilkes campus community. Each section of FYF is unique in content and constitutes a special topics course in which faculty members are encouraged to explore topics that are of special interest to them. All sections of FYF, regardless of specific topic, share a common core of objectives that facilitate significant learning experiences (inside and beyond the classroom) by which first-year students develop self-knowledge as learners and members of an academic community, intellectual curiosity, openness to diversity, and a capacity for lifelong learning and civic responsibility. Activities designed to foster and develop effective writing, critical thinking, and information literacy skills are integral components of all FYF courses. In addition, the FYF Program connects students to a wide variety of University resources, including the advising and tutoring services of University College, the extensive holdings and services of the Farley Library, and the rich array of cultural events sponsored by the University.

FR, GR, LAT, MAN, RUS. FOREIGN LAGUAGES

GR-101-102. ELEMENTARY GERMAN
Credits: 3 each

Fundamentals of spoken and written German and introduction to German culture. Emphasis is placed on communicative proficiency.

MAN-101-102. ELEMENTARY MANDARIN CHINESE
Credits: 3 each

Fundamentals of spoken and written Mandarin and introduction to Chinese culture. Emphasis is placed on communicative proficiency.

LAT-101-102. ELEMENTARY LATIN
Credits: 3 each

An introduction to the fundamentals of Latin (vocabulary, translation skills and grammatical concepts) with emphasis on the role of Latin in the history of western intellectual tradition.

RUS-101-102. ELEMENTARY RUSSIAN
Credits: 3 each

Fundamentals of spoken and written Russian and introduction to Russian culture. Emphasis is placed on communicative proficiency.

FR-101-102. ELEMENTARY FRENCH
Credits: 3 each

Fundamentals of spoken and written French and introduction to French culture. Emphasis is placed on communicative proficiency. Students who have studied French for more than two years in high school (or the equivalent) should enroll in FR 102.

GIS. GEOGRAPHIC INFORMATION SCIENCE

GIS-298/398. TOPICS IN GEOGRAPHIC INFORMATION SCIENCE
Credits: Varies with topic studied.

Course on GIS topics of special interest, not extensively treated in regularly scheduled offerings, will be presented under this course number on an occasional basis. May be repeated for credit.

Pre-Requisites

Varies with topic studied.

Co-Requisites

Varies with topic studied.

GIS-271. INTRODUCTION TO GPS & GIS
Credits: 3

An introduction to Global Positioning Systems (GPS), Geographic Information Systems (GIS), and geospatial mapping concepts and applications. Topics include coordinate systems, reference ellipsoids, geodetic datums, map projections, history of GIS, relational database management, quality control, GIS as a decision support tool, and data manipulation, processing, and analysis. Practical field use of GPS is emphasized within the context of understanding system components, satellite signal processing, selective availability, base station differential correction, and data export to GIS. Geospatial data science is discussed within the context of real-world locational phenomena. This course it designated as computer intensive (CI). Two hours of lecture and three hours of lab per week.

Click here for course fees.

GIS-272. ADVANCED GIS & REMOTE SENSING
Credits: 3

An advanced course on Geographic Information Systems (GIS) and Remote Sensing. GIS topics build upon introductory-level coursework in GIS 271, and introduce more advanced applications of GIS software such as density mapping and interpolation of point data (geostatistical methods), surface analysis and 3D modeling of geospatial data, open source alternatives to ArcGIS, and web map design and development design. Remote sensing topics include aerial and satellite visual imagery, digital image processing, photogrammetry, Light Detection and Ranging (LiDAR), and multispectral remote sensing systems and theory. The course will also include case studies of remote sensing and GIS techniques applied in a variety of studies. Field use of GPS is emphasized, in addition to the use of small Unmanned Aerial Systems (sUAS) to capture aerial digital imagery. Laboratory component emphasizes practical skills and tools in achieving desired results in processing geospatial data, particularly raster data types. This course it designated as computer intensive (CI). Two hours of lecture and three hours of lab per week.

Click here for course fees.

Pre-Requisites

[[GIS-271]], or permission of the instructor.

GIS-301. GIS APPLICATIONS & COLLOQUIA
Credits: 3

This course will further explore fundamental and advanced GIScience topics through solving real-world problems. It will provide a practical, hands-on approach to learning about GIS applications for a selection of different fields such as security, criminology, business/marketing, human and health services, epidemiology, environmental systems, geology, political science, natural resources, urban planning, and agriculture, among others. Additionally, the course includes a colloquia component (required for students enrolled in the course), where students will have the opportunity to industry and academic experts in GIScience applications to various fields. The colloquia component would also be open to the public. This course it designated as computer intensive (CI). Three hours of lecture per week.

Click here for course fees.

Pre-Requisites

[[GIS-272]] or permission of the instructor.

GIS-310. GIS PROGRAMMING AND CUSTOMIZATION
Credits: 3

The course introduces students to methods of solving geospatial problems by creating automated Geographic Information System (GIS) software through programming. Python programming language – with its simple syntax and powerful set of libraries – will be used to write and edit scripts that add functionality to existing GIS desktop tools and to automate geospatial analytic processes. No previous programming experience is required. Python programming topics will include object-oriented programming, object model diagrams, loops, if-then statements, and modular code design within the context of geospatial analytics and workflows to solve geospatial problems. This course it designated as computer intensive (CI). Two hours of lecture and three hours of lab per week equivalent.

Click here for course fees.

Pre-Requisites

[[GIS-271]], or permission of the instructor.

GIS-315. WEB GIS
Credits: 3

In this course, students will have hands-on experience creating web applications with interactive maps combining different types of geospatial data. The fundamental technology behind web maps – including capabilities and limitations – will be explained, including relevant geospatial systems, server software, data sources, and web development languages (i.e., HTML, CSS, JavaScript). No prior programming language experience is needed for this course. Students will gain valuable experience in creating web GIS applications, and will be ready to apply their knowledge in academic and professional fields. This course it designated as computer intensive (CI). Two hours of lecture and three hours of lab per week equivalent.

Click here for course fees.

Pre-Requisites

[[GIS-271]], or permission of the instructor.

GIS-320. INTRODUCTION TO GEOSPATIAL MODELING
Credits: 3

This course introduces how GIS can be used to construct and simulate dynamic models of geospatial phenomena, which involve variation over space and/or time. This course provides foundations on geospatial modeling, and an understanding of various issues related to geospatial modeling and simulation. Students will learn concepts, tools, and techniques commonly used in GIS modeling, including approaches from continuous representation of system dynamics to the discrete interactions of individual, agent-based models. This course it designated as computer intensive (CI). Two hours of lecture and three hours of lab per week.
Click here for course fees.

Pre-Requisites

[[MTH-150]] or higher, [[GIS-272]], or permission of the instructor.

GEO. GEOLOGY

GEO-101. INTRODUCTION TO GEOLOGY
Credits: 3

Description, analysis, and studies of earth materials, structures, and processes, including Earth's surface, interior, age, and origin. Three hours of lecture per week.

GEO-103. INTRODUCTION TO GEOLOGY LAB
Credits: 1

This lab entails lab and field experiences where rocks and minerals are studied. The interpretation of topographic and geologic maps and exercises in the fundamental procedures of geologic investigations are also included. Three hours of lab per week.

Click here for course fees.

Co-Requisites

[[GEO-101]]

GEO-206. SOLID EARTH ENERGY AND MINERAL RESOURCES
Credits: 3

The distribution in both space and time of fossil fuel (crude oil, natural gas, and coal), nuclear fuel minerals, and geothermal sources in the eatth' s crust; the formation, accumulation and extraction of these energy resources, and historical, current and projected consumption trends. Additionally, the occurrences and formational processes of metal and non-metal deposits are examined in the context of plate tectonics, earth's geologic history and energy flow. Three hours of lecture per week. Open to majors and non-majors. GEO-206 qualifies for the Energy Minor and is cross-listed with [[EGY-206]].

GEO-212. HISTORICAL GEOLOGY
Credits: 3

A study of the geologic record of the earth's formation and evolution, including methods of dating. Two hours of lecture and three hours of lab per week.
Click here for course fee.

Pre-Requisites

[[GEO-101]] and [[GEO-103]] or permission of the instructor.

GEO-281. MINERALOGY
Credits: 4

The systematic study of the major classes of the mineral kingdom utilizing the department's collection. Concepts in crystal chemistry, crystal structure, mineral behavior, crystallography and optical mineralogy are studied and advanced techniques in mineral analysis are used. Three hours of lecture and three hours of lab per week.
Click here for course fee.

Pre-Requisites

[[GEO-101]] and [[CHM-115]].

GEO-282. PETROLOGY
Credits: 3

A study of the identification, classification, composition, genesis, and alteration of igneous, sedimentary, and metamorphic rocks and their relation to crustal processes and tectonic environments. Two hours of lecture and three hours of lab per week.
Click here for course fee.

Pre-Requisites

[[GEO-281]]

GEO-345. STRATIGRAPHY AND SEDIMENTATION
Credits: 4

The study of the formation and interpretation of sedimentary systems, from sediment grains to depositional basins. The course starts from the grain scale and moves up to basin and global scales. Three hours of lecture and three hours of lab per week.
Click here for course fee.

Pre-Requisites

[[GEO-101]] and [[GEO-103]], or permission of the instructor.

GEO-349. STRUCTURE AND TECTONICS
Credits: 4

The study of rock deformational processes and resulting structures in the Earth's crust with application to global and regional tectonics. Lab work and field trips emphasize the use of methods to assist in the geometric and kinematic interpretation of rock structures. Three hours of lecture and three hours of lab per week.
Click here for course fee.

Pre-Requisites

[[GEO-282]], [[GEO-345]], [[MTH-111]], [[PHY-171]] or permission of the instructor

GEO-351. PALEOCLIMATOLOGY
Credits: 3

The goal of this course is to present an overview of the methods used to reconstruct the earth’s climate history and the techniques used to determine the timing of environmental changes. Paleoclimate data from proxy records, such as ice cores or tree rings, provides a longer perspective on climatic variability than is possible from instrumental or historical records. Particular emphasis will be given to the natural controls on Earth’s climate across a variety of timescales, including plate tectonic, orbital, and millennial, to centennial and sub-decadal variations. The course will focus on the climatic changes during the late Cenozoic – the time of the ice ages. Topics to be discussed will include: paleoclimatic reconstruction, climate and climatic variation, dating methods, ice cores, marine and lake sediments, corals, speleothems, soils, pollen, dendrochronology, documentary data, and paleoclimate models. Two hours of lecture and three hours of lab.

Click here for course fee.

Pre-Requisites

[[GEO-101]] and [[GEO-103]], or permission of the instructor.

GEO-352. HYDROGEOLOGY
Credits: 3

An introduction to the study of groundwater: groundwater flow, well hydraulics, groundwater quality and pollution, and resource exploration, evaluation, and management. Lab activities use a mix of field, wet lab, computer and mapping skills. Two hours of lecture and three hours of lab per week.
Click here for course fee.

Pre-Requisites

[[GEO-101]] and [[GEO-103]], or permission of the instructor.

GEO-365. INTRODUCTION TO PALEONTOLOGY
Credits: 3

This course examines the history of life on Earth as reflected in the fossil record. The course covers the oldest known forms of life from over three billion years ago through the origin of marine communities, the invasion of land, dinosaurs, and the age of mammals. Emphasis will be placed on common fossil groups and the interaction of organisms with their diverse environments. Two hours of lecture and three hours of lab per week.

Click here for course fees.

Pre-Requisites

[[GEO-101]], [[GEO-103]], and [[GEO-212]]

GEO-370. GEOMORPHOLOGY
Credits: 3
Fees:

Land forms, their evolution, and the human role in changing the surface of the earth, utilization of geologic and hydrologic information, and field investigations. Two hours of lecture and three hours of lab per week.
Click here for course fee.

Pre-Requisites

[[GEO-101]] and [[GEO-103]], or permission of the instructor.

GEO-375. GEOLOGICAL HAZARDS
Credits: 3
Fees:

This course examines geologic processes that are a natural consequence of plate tectonics and hazardous to life and property. After establishing a framework for geologic hazards study, principle geologic hazards will be investigated. Emphasis will be placed on current scientific understanding, event frequency, forecasting and monitoring and mitigation. Several case studies will be included. Three hours of lecture per week.

Pre-Requisites

[[GEO-101]], [[GEO-103]], and [[GEO-212]].

GEO-380. GEOLOGY FIELD CAMP
Credits: 4
Fees:

A four-week summer field course designed to train students in traditional and modern methods of geologic investigations. Students learn to develop research strategies, collect field observations and measurements, compile detailed rock descriptions, measure stratigraphic sections and construct geologic maps and cross sections. Field locations may range from local/regional to western U.S. depending on course emphasis and resources.
Click here for course fee.

Pre-Requisites

[[GEO-281]], [[GEO-282]], [[GEO-345]], [[GEO-349]]

GEO-383. GEOCHEMISTRY
Credits: 3
Fees:

Application of chemistry to study the distribution and cycling of elements in the crust of the earth. Includes chemical bonding and crystallization, phase rules and phase diagrams, chemical equilibria, radiogenic and stable isotopes and origin of elements. Geochemical environments of study include low-temperature aqueous solutions and high-temperature magmatic systems. Two hours of lecture and three hours of lab per week.
Click here for course fee.

Pre-Requisites

[[CHM-115]], [[CHM-116]], [[GEO-101]], [[GEO-103]], [[GEO-281]], and [[GEO-282]]

GEO-388. REGIONAL STUDIES
Credits: 2

This capstone course is an in-depth geological study of a region (global,or mote local) that requires students to apply fundamental lmowledge and skills acquired through the course of their college education. The region of study will be selected by the instructor in advance of the course, taking into consideration student interest, accessibility, and unique field opportunities. The course furthers student scientific research skills and enhances learning through the involvement of advanced studies of primary rock/geologic/geophysical relationships in a field setting, critical reading of published geological literature, and interpretation and synthesis in oral/written formats. Topics and scale of examination will vary from local to global scales, but focus heavily on the regional scale. Students will be encouraged to think scientifically and creatively - to think from unique perspectives and explore versatile solutions. Field study will play a significant role in this course, and students will assist in organizing an optional research trip over spring break to locations within the region of interest, enhancing their overall geologic lmowledge, research and interpretation skills, and application of principles and theories.

Pre-Requisites

Senior status and with permission from the course instructor.

GEO-390. APPLIED GEOPHYSICS
Credits: 3
Fees:

An introduction to the application of geophysical methods to geological and environmental investigations. Topics include fundamentals of geophysics and hands-on instrument training and measurement. Instruments may include ground penetrating radar, seismic reflection and refraction, electrical resistivity and electromagnetic induction. Two hours of lecture and three hours of lab per week.
Click here for course fee.

Pre-Requisites

[[GEO-101]], [[GEO-103]], [[MTH-112]], [[PHY-174]], or permission of the instructor

GEO-391. SENIOR PROJECTS I
Credits: 1
Fees:

Design and development of selected research projects in geology under the direction of a faculty member. Capstone research deliverables include a proposal, detailed progress reports and a formal mid-year report.

Click here for course fee.

Pre-Requisites

Department permission

GEO-392. SENIOR PROJECTS II
Credits: 2
Fees:

Second semester continuation of Senior Projects I. Capstone research deliverables include detailed progress reports, a professional-grade poster, a final written report, and a formal oral presentation of research project.
Click here for course fee.

Pre-Requisites

[[GEO-391]]

GEO-395. INDEPENDENT STUDY
Credits: Varies with topic
Fees:

Departmental courses on advanced topics of special interest, not extensively treated in regularly scheduled offerings, will be presented under this course number on an occasional basis. Available for either undergraduate or graduate credit. Maybe repeated for credit

Pre-Requisites

Senior or graduate standing

GEO-396. INDEPENDENT STUDY
Credits: Varies with topic
Fees:

Departmental courses on advanced topics of special interest, not extensively treated in regularly scheduled offerings, will be presented under this course number on an occasional basis. Available for either undergraduate or graduate credit. Maybe repeated for credit.

Pre-Requisites

Senior or graduate standing

GC. GLOBAL CULTURES

GC-253. MALAYSIA'S MODERNITY
Credits: 3

Examine and experience Malaysia's unique brand of modernity, which is the result of a national push towards fully developed nation status. Technologically advanced, yet steeped in diverse traditional beliefs, Malaysia is the ideal place to study a modern, non-western culture through an exploration of the diverse and often contrasting beliefs and values, a task made easier by the fact that English is widely spoken and western ways are well-accepted. This three-credit course includes an optional two-week trip to Malaysia at an extra fee.

GC-301. GLOBAL CULTURES: ISSUES AND PERSPECTIVES
Credits: 3

A broad interdisciplinary introduction to the issues and theory underlying the study of global cultures, this course will address the global forces that contribute to the shaping of cultures, including: migration and diaspora, colonization, religion and spirituality, rights of women and children, health and poverty, privilege and class, indigenous peoples of the world, globalization, terrorism, war and trauma, environmental and cultural sustainability, cultural identity development, and the arts. Particular attention will be given to ethics and global citizenship. This course will serve as a foundation for students in choosing to further their studies in one global culture or issue of interest, in order to integrate this knowledge into their future careers.

HST. HISTORY

HST-101. THE HISTORICAL FOUNDATIONS OF THE MODERN WORLD
Credits: 3

A thematic survey of the forces shaping the modern world. Topics studied include the following: world religions; science; rationalism; industrial capitalism; liberalism; socialism; global discovery; imperialism; nationalism; and totalitarianism.

HST-102. EUROPE BEFORE 1600
Credits: 3

A survey of European history from Ancient times through the Reformation.

HST-125. AMERICAN HISTORY I
Credits: 3

A survey of North American and U.S. history from European-Native American contact to the Civil War.

HST-126. AMERICAN HISTORY II
Credits: 3

A survey of U.S. history from the Civil War to the present

HST-211. INTRODUCTION TO PUBLIC HISTORY
Credits: 3

An introduction to the debates, issues and practice of public history. Students will explore specific careers in public history, learn the research tools and methods used by public historians, and apply public history methodology to larger historical questions.

HST-252. THE CHANGING FACE OF EASTERN EUROPE
Credits: 3

This course explores the theoretical and empirical problems related to the process of transition to democracy in Central and Eastern Europe. Topics such as privatization, human rights, transitional justice, security dilemmas and institutional deadlock are addressed in this course.

HST-297. HISTORICAL RESEARCH AND METHODS SEMINAR
Credits: 3

An introduction to the skills and methods needed for successful research and writing about history. Enrollment is limited to history majors and minors except by permission of the instructor.

HST-311. ORAL HISTORY (A)
Credits: 3

This is a 'hands on' course in which we will examine the use of structured interviews by both professional and amateur historians. Students will both conduct oral history interviews and plan oral history projects. This course is ideal for teachers, church and other local historians, as everyone should end the semester with the ability to design and execute their own oral history project. No prior historical or technical knowledge is assumed or needed.

HST-312. AMERICAN MATERIAL CULTURE (A)
Credits: 3

An introduction to the theories and methods of material culture. By studying objects and employing interdisciplinary approaches, students will investigate American material life and attempt to uncover attitudes and beliefs of the individuals and culture that produced those objects.

HST-321. AMERICAN CULTURAL AND SOCIAL HISTORY (A)
Credits: 3

An examination of differences and divisions within American society through such topics as social movements, demographic trends, gender, ethnicity, and class, the effect of industrialization and immigration, cultural expressions, religion, and the family.

HST-324. AMERICAN ECONOMIC HISTORY (A)
Credits: 3

A survey of the evolution of the American economy from colonial dependency to modern industrial maturity. Emphasis will be placed upon the development of the United States as an industrial world power since about 1850.

HST-325. DIVERSITY IN PENNSYLVANIA HISTORY (A)
Credits: 3

A study of the history of the Commonwealth with particular focus on ethnic and racial diversity.

HST-328. HISTORY OF THE FOREIGN POLICY OF THE UNITED STATES (A)
Credits: 3

A selective treatment of major themes in American foreign policy from the founding of the Republic to the present.

HST-329. AMERICAN WOMEN'S HISTORY (A)
Credits: 3

A study of the role, status, and culture of women in America beginning with the First Americans and European contact to the present time.

HST-331. COLONIAL AMERICA (A)
Credits: 3

Discovery, exploration, and settlement; development of social, political, religious, and intellectual institutions; independence and political reorganization.

HST-332. THE NEW NATION (A)
Credits: 3

A study of America's social, cultural, economic and political development in the first generations of nationhood, 1783-1840.

HST-333. VICTORIAN AMERICA (A)
Credits: 3

A study of the development of the United States from the end of the Civil War through the end of World War I. Special attention will be paid to urbanization and industrialization and their effects on everyday life.

HST-334. THE UNITED STATES, 1900-1945 (A)
Credits: 3

The emergence of the United States as a world power and the corresponding development of its political, economic, social, and religious institutions.

HST-335. THE UNITED STATES SINCE 1945 (A)
Credits: 3

An examination of the political, social, and economic changes in the United States since World War II. Special attention is paid to America's dominant role in the immediate post-war world and how changing conditions over the past forty years have altered this role.

HST-341. HISTORY OF GREAT BRITAIN AND THE BRITISH EMPIRE AND COMMONWEALTH
Credits: 3

A study of British history from the Neolithic period to present times. The first semester will cover social, economic, and political developments to 1783, including expansion overseas. The second semester, [[HST-342]], will cover the consequences of the industrial revolution and the evolution of the Empire into the Commonwealth.

HST-342. HISTORY OF GREAT BRITAIN AND THE BRITISH EMPIRE AND COMMONWEALTH
Credits: 3

A study of British history from the Neolithic period to present times. The first semester, [[HST-341]], will cover social, economic, and political developments to 1783, including expansion overseas. The second semester will cover the consequences of the industrial revolution and the evolution of the Empire into the Commonwealth.

HST-345. HISTORY OF NORTHEASTERN EUROPE (N)
Credits: 3

A study of the cultural, political and intellectual history of the Poles, Czechs, Slovaks, Croats, Slovenes and Hungarians, who occupy the northern tier of Eastern Europe. Special attention is given to the roles of the Habsburg and Russian empires in shaping the historical destinies of these peoples, and to the roots and consequences of the forces of nationalism in the region.

HST-346. HISTORY OF THE BALKANS (N)
Credits: 3

A study of the cultural, political and intellectual history of the Bulgarians, Serbs, Croats, Slovenes, Albanians, Greeks, Romanians and Turks, who occupy the southern, or Balkan, tier of Eastern Europe. Special attention is given to the roles of the Ottoman Turkish, Habsburg and Russian empires in shaping the historical destinies of these peoples, and to the roots and consequences in the region of such forces as Christian-Muslim cultural interrelationships and nationalism.

HST-348. HISTORY OF RUSSIA (N)
Credits: 3

A study of the political, social, and intellectual history of Russia. Emphasis is placed upon the emergence of Russia as a major power after 1700.

HST-352. THE RENAISSANCE AND GLOBAL CONNECTIONS (N)
Credits: 3

The course examines the growing interconnectivity of the globe from the fourteenth to sixteenth centuries brought about by the Columbian Exchange, trade in Asia and religious and cultural reform. It pays particular attention to the impact these connections had upon culture, trade, religious ideas and political conflict. The precise geographic perspective of the course is contingent upon instructor.

HST-353. GLOBAL EMPIRES OF THE EIGHTEENTH CENTURY (N)
Credits: 3

The political, social, economic, intellectual, and cultural development of the world from the early seventeenth through late eighteenth centuries. The precise geographic perspective of the course is contingent upon instructor.

HST-354. THE AGE OF REVOLUTIONS IN A GLOBAL CONTEXT (N)
Credits: 3

This course will examine the circumstances which resulted in the political and economic revolutions of the late eighteenth and early nineteenth centuries and their impact on the wider world. The precise geographic perspective of the course is contingent upon instructor.

HST-355. THE NINETEENTH CENTURY GLOBAL ORDER (N)
Credits: 3

This course will examine the political, social, economic and cultural development of the world as impacted by Imperialism and the birth of the capitalist global economy from the mid-nineteenth to early twentieth centuries. The precise geographic perspective of the course is contingent upon instructor.

HST-356. WORLD WAR I AND INTERWAR PERIOD (N)
Credits: 3

This course will examine the international causes of World War I, the Treaties of Versailles, and the new world that resulted, leading to the outbreak of World War II in 1939.

HST-357. THE WORLD SINCE 1945 (N)
Credits: 3

This course examines many important events and developments in the modern world since 1945. It considers incidents of largely historical significance, such as the Cold War between the United States and the Soviet Union, and those of continuing relevance, like the globalization and privatization of the economy.

HST-370. INTRODUCTION TO LEGAL HISTORY
Credits: 3

The law is a complex system that has developed over time and in reaction to societal and cultural trends. This course will look at the history of the law and the legal professions in England and the United States over the last fifteen hundred years from a variety of perspectives.

HST-371. HISTORY OF INTERNATIONAL LAW
Credits: 3

This course will examine the historical development of public international law globally over the last five hundred years with an emphasis on the period from 1850 to the present. Topics include the state, treaties, peaceful conflict resolution, the law of the sea, human rights, and the law of international organizations.

HST-376. WORLD WAR II (C)
Credits: 3

Consideration of the causes of the war, military strategy and tactics, diplomatic interests of the participants, and resulting cold war problems.

HST-397. SEMINAR
Credits: 3

Presentations and discussions of selected topics.

Pre-Requisites

Approval of instructor is required.

HST-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See the Cooperative Education section of this bulletin for placement procedures.)

Pre-Requisites

Sophomore standing, minimum 2.0 cumulative GPA, consent of academic advisor, and approval of placement by the department chairperson.

Honors Program. HONORS PROGRAM

HNR-395/396. HONORS PROGRAM INDEPENDENT RESEARCH
Credits: 1 to 3

Independent study and research for advanced Honors Program students under the direction of a faculty member from any department, with the opportunity to work with interdisciplinary content and/or methods which incorporate Honors-related components integrally into the curriculum. A culminating, comprehensive research product is required. Requirements: permission of the instructor.

HNR-198/298/398. HONORS PROGRAM TOPICS SEMINARS
Credits: 1

Seminar-style courses for Honors Program students that cover topics of special interest not extensively treated in regularly-offered courses. Such courses would provide faculty from all departments the opportunity to teach interdisciplinary content and/or methods which incorporate Honors-related components integrally into the curriculum.

HNR-390. HONORS CAPSTONE SEMINAR
Credits: 1

This one-credit interdisciplinary capstone research seminar serves as a culminating experience for all prospective Honors Program graduates. The course is intended to explicitly engage students in reflection on what they have learned at Wilkes and how they can advance those skills and insights along their future personal and professional trajectories. Consequently, the course depends on students' consistent investment in critically assessing what they have learned during their undergraduate education, how that can be communicated to others, and what that makes possible for future endeavors.

HL. HOSPITALITY LEADERSHIP

HL-198/298/398. TOPICS
Credits: 3
Terms Offered: On Demand

In-depth examination of selected issues and problems in hospitality. Specific topics alternate depending on hospitality trends in areas such as travel and tourism, introduction to wine, club and resort management, hospitality information systems, and hospitality seminar.

HL-201. INTRODUCTION TO HOSPITALITY
Credits: 3
Terms Offered: Fall,Spring

The course is designed to introduce students to an overview of the hospitality industry with various managerial aspects and numerous career opportunities in lodging, food and beverage, gaming, tourism, cruises, airlines, managed services for clubs and institutions, and the convention and meeting industry. The course supports the Hospitality Leadership program by developing individuals who have chosen the hospitality industry as their career path.

Pre-Requisites

[[BA-152]] or [[BA153]] with a minimum grade of 2.0

HL-325. ADVANCED HOSPITALITY MARKETING
Credits: 3

This course is designed to provide students with a better understanding of service marketing exploring the selected issues in the hospitality and tourism industry. Marketing plays a significant role for all firms, and understanding how to best utilize marketing resources is a critical skill in real-world applications.

Pre-Requisites

[[HL-201]] with a minimum grade of 2.0

HL-341. HOSPITALITY FINANCE
Credits: 3

This course is designed to overview fundamental knowledge of financial management, managerial accounting, and operational cost controls for the hospitality industry. It applies principles of finance and accounting for decision-making that can be applied to the hospitality industry.

Pre-Requisites

[[HL-201]] and [[FIN-240]] with a minimum grade of 2.0

HL-353. HUMAN RESOURCE MANAGEMENT IN THE SERVICE INDUSTRY
Credits: 3
Terms Offered: Fall

This course is designed to provide students with a better understanding of how employees learn, communicate, lead, and deal with stress, conflict, and change. Understanding themselves better will allow students to better understand how to manage others. Students will also discuss various management theories in an attempt to identify the most effective management strategy for employees.

Pre-Requisites

[[HL-201]] with a minimum grade of 2.0

HL-355. EVENT MANAGEMENT
Credits: 3

This course is designed to provide an introduction to the principles of event management. Students will learn how to formulate event tourism strategies for destinations. The planning, development, management, and implementation of festivals, entertainment events, corporate events, cultural events, and sports events will be the focus of study.

Pre-Requisites

[[HL-201]] with a minimum grade of 2.0

HL-356. HOSPITALITY LAW & LEADERSHIP ETHICS
Credits: 3

This course is designed to cover the functions of the law, legal environment, and ethical leadership analysis within the hospitality industry. Students will examine ethical issues in the hospitality industry as they relate to legal reasoning regarding contracts, torts, property, and the impact of law on economic enterprises in the hospitality industry.

Pre-Requisites

[[HL-201]] and [[BA-335]] with a minimum grade of 2.0

HL-381. HOTEL OPERATIONS MANAGEMENT
Credits: 3
Terms Offered: On Demand

This course is designed to introduce students to the principals and practices of managerial functions relating to the operation of hotel facilities. Students will gain an understanding of how work is performed with each major departments in a hotel property. Students will also be exposed to each role of the department operations in completing a practicum at the local hotels.

Pre-Requisites

[[HL-201]] with a minimum grade of 2.0

HL-382. FOOD AND BEVERAGE MANAGEMENT
Credits: 3
Terms Offered: On Demand

This course is designed to introduce the basics of the roles and responsibilities of management in food and beverage operations. Students will discuss topics that include: organization of the food and beverage operation, food and beverage marketing, menu planning, cost controls, proper inventory procedures, purchasing, storage, front of house management, maintaining profitable operations, and liquor handling and training.

Pre-Requisites
[[HL-201]] with a minimum grade of 2.0

HL-386. GAMING AND CASINO MANAGEMENT
Credits: 3
Terms Offered: On Demand

This course introduces the student to the history of the gaming industry and the basics of casino management. The course emphasizes ethics in the gaming industry, the economics of the industry, and its interface with hotel and restaurant organizations. Students will also overview the basic gaming regulations, profit and organizational structures of casino operations, and an introduction to some popular casino games.

HL-461. CAPSTONE IN HOSPITALITY
Credits: 3
Terms Offered: Fall,Spring
This course integrates the functional areas of business from the perspective of top management. Emphasis is on the role of management in the formation of strategic and long-range plans.

Cross listed with BA 461.

Pre-Requisites
[[EC-101]], [[EC-102]], [[FIN-240]], and [[HL-325]] with a minimum grade of 2.0

HL-462. HOSPITALITY INTERNSHIP
Credits: 3
Terms Offered: Fall,Spring,Summer

A work-based learning experience that focuses on an area of interest in the hospitality industry. Students will experience the opportunity to apply the theory learned in the program within a hospitality business setting.

Pre-Requisites
[[HL-201]] with a minimum grade of 2.0

HL-466. ADVANCED HOSPITALITY INTERNSHIP
Credits: 3
Terms Offered: Fall,Spring,Summer
Students will have a supervised managerial work experience in a hospitality setting. Students will also experience the opportunity to apply the theory learned in the program within a hospitality business setting.

Pre-Requisites
[[HL-201]], [[HL-381]] (or [[HL-382]]) with a minimum grade of 2.0

IM. INTEGRATIVE MEDIA

IM-198/289/398. TOPICS IN INTEGRATED MEDIA
Credits: Varies with topic.
A study of topics of special interest not extensively treated in regularly offered courses.

Click here for course fee.

IM-101. INTEGRATIVE MEDIA FOUNDATIONS I
Credits: 3
This course is an introduction to a survey of artists, styles, and techniques influential in the development of contemporary media. Through screenings, readings, projects, and exercises, the creative process will be analyzed, developed, and elevated. Course exercises will stimulate, inspire, and expand personal aesthetic vision. Through intensive thought, analysis, and critique we will explore media as it affects our society and our responsibility as media content generators.
Click here for course fees.

IM-120. FOUNDATIONS OF GAME DESIGN
Credits: 3
This course provides an introductory overview of the video game design by focusing on development principles, techniques, process, and tools. Students will explore and investigate the history and evolution of video games and a variety of game genres. Students will also learn team collaboration as well as using game development software to create simple conceptual prototypes during the course.
Click here for course fees.
Pre-Requisites
None

IM-201. INTEGRATIVE MEDIA FOUNDATIONS II
Credits: 3
This course is an introduction to the foundational design principles as they apply to digital new media applications. Students will produce digital projects through the introductory application of various digital tools with a continued focus on the constant evolution of a personal aesthetic vision. A survey of new media applications, terminology, and techniques will be researched and discussed, along with our responsibility as communicators to mass media markets.
Click here for course fees.

Pre-Requisites
[[IM-101]].

IM-210. INTRODUCTION TO GAME DEVELOPMENT (2D)
Credits: 3

A project-based course emphasizes applying game design principles to produce interactive visual storytelling and simple 2D games. Students will learn basic coding, 2D animation and physics, and be introduced to a variety of game engines to create fun and interactive games through the coursework.
Click here for course fees.

Pre-Requisites

[[IM-120]]
[[CS-125]]

IM-240. CROSS-MEDIA TYPOGRAPHY
Credits: 3

This course takes a critical look at type and its proper usage in multiple forms of media. In addition
to type identification and usage, we will take a critical look at seminal works of typography and
understand their impact and effectiveness. This course is offered in the Spring semester of each
academic year.
Click here for course fees.

Pre-Requisites

[[IM-101]]

IM-255. INTEGRATIVE MEDIA PRACTICUM
Credits: 1-2

The Department Practicum may be taken for one to two credits per semester. Students may earn credit for major roles and positions of major responsibility in the co-curricular activities in the Creative Production Studio, Studio 020. Credit for participation in these activities is optional, and voluntary participation (without credit) is also encouraged. The department, through the advisor or instructor of the activity, has the authority to approve or reject any contract for credit under this designation. Credits earned are applicable toward graduation, but do not count toward the requirements of the IM core. Written approval for credit must be by advisor or department chairperson.

IM-301. INTEGRATIVE MEDIA PRINCIPLES OF MOTION AND LAYERING
Credits: 3

This course will address the foundational concepts of assembling digital imagery, relational to short format projects, focusing on historical and contemporary principles of montage, timing, and pacing. In addition, the technical and aesthetic principles of compositing will be covered producing multi-layered projects for a variety of media.
Click here for course fees.

Pre-Requisites

[[IM-201]].

IM-302. INTEGRATIVE MEDIA PRINCIPLES OF INTERACTIVITY
Credits: 3

Technical and aesthetic principles of interactivity will be conveyed and practiced to produce a range of interactive media. Addressing issues of human static and dynamic interactive ergonomics as they apply to contemporary commercial and artistic applications.
Click here for course fees.

Pre-Requisites

[[IM-201]].

IM-303. ADVANCED PRINCIPLES OF INTERACTIVITY
Credits: 3

In this course students will gain an advanced understanding of how to design and develop online material. Students will become familiar with HTML and CSS web-based languages as well as on-line interface and digital media design requirements. Students will design and code responsive web pages using the CSS syntax. Industry standard computer graphics programs and Internet based programs to create original and unique on-line material will be used by students. Functionality and aesthetics will be stressed as students gain exposure to the digital media design process.
Click here for course fees.

Pre-Requisites

[[IM-302]]

IM-304. 2D APP DEVELOPMENT
Credits: 3

This course focuses on the creation of mobile app solutions. Students will learn mobile app concept design and prototyping as well as basic programming to implement the design process using industry-standard software. Topics include mobile device architecture, user interface design, app prototyping programming lanuages, and app deployment.
Click here for course fees.

Pre-Requisites

[[IM-302]]

IM-310. ADVANCED GAME DEVELOPMENT (3D)
Credits: 3

A design studio course focusing on industry processes and 3D interactive game development from start to finish using program languages. The developed games can run on a variety of platforms such as desktops, mobiles, and AR/VR devices. This course also provides students with insights on not only creating games, but also using the game development pipeline to solve real-world simulation and visualization problems.
Click here for course fees.

Pre-Requisites

[[IM-210]]
[[IM-350]]
[[IM-368]]

IM-320. INTEGRATIVE MEDIA CONCEPT DEVELOPMENT AND PRACTICES
Credits: 3

Through research, writing, and example, students will gain an advanced understanding of the creative generating processes in a new media environment. These processes will be used to formulate solid, cohesive concepts and present storyboards that are visually communicative and professional. With discussion, critique, and reiteration, the concepts are refined and reinforced.
Click here for course fees.

Pre-Requisites

[[IM-201]].

IM-330. VIRTUAL ENVIRONMENTS AND EMERGENT TECHNOLOGY
Credits: 3

An introductory project-based course exposing the principles of virtual/augmented reality technologies including displays, tracking, and major hardware platforms and their capabilities. This course also prepares students to utilize these technologies to create interactive content and artworks.
Click here for course fees.

Pre-Requisites

[[IM-210]]
[[IM-350]]
[[IM-368]]

IM-341. CROSS-MEDIA TYPOGRAPHY II
Credits: 3

Cross-Media Typography II is a semester-long intensive project-generating course that employs typographic concepts discussed in Cross-Media Typography I. Each project is meant to explore further applications of type as art, as well as type in professional practice. The course is a combination of in-class studio work and independent research on portfolio-quality projects. It will be offered in the spring semester each academic year.
Click here for course fees.

Pre-Requisites

[[IM-240]]

IM-350. 3 DIMENSIONAL ENVIRONMENTS AND ANIMATION
Credits: 3

This course will explore the foundations of 3-dimensional animation processes as they apply to multiple media. Students will build computer-based models and environments, texture, light, animate, and render content for Integrative Media projects, stand-along projects of 3-D foundations used within the CS gaming track. (Cross-listed with [[CS-366]].)
Click here for course fees.

Pre-Requisites

IM students— [[IM-301]] ; CS students— [[CS-125]].

IM-351. 3D ENVIRONMENTS & ANIMATION II
Credits: 3

This course will explore advanced functions of the 3 Dimensional animation processes as they apply to gaming. Students will build computer-based models and environments; subsequently, texture, light, animate as appropriate and efficiently render as content for 3D gaming projects or as stand-alone pieces.
Click here for course fees.

Pre-Requisites

[[IM-350]] OR [[CS-366]]

IM-355. DIGITAL AUDIO PRINCIPLES AND EDITING
Credits: 3

The foundational concepts behind music theory, sound design, and digital studio editing techniques will be addressed in this course. This knowledge can then be applied to creating and adapting sound components for use within the variety of Integrative Media projects.
Click here for course fees.

Pre-Requisites

[[IM-201]].

IM-368. 3D ASSETS MODELING AND DEVELOPMENT
Credits: 3

A course with a focus on theory, creation, and animation of three-dimensional models used within a game context using industry standard software.
Click here for course fees.

Pre-Requisites

[[IM-350]] or [[CS-366]].

IM-391. INTEGRATIVE MEDIA PROJECT I
Credits: 3

This project-based course will begin to assemble production teams to produce project(s) from concept to completion. Students will develop storyboards and, through creative and organizational work sessions, define a completion plan and production schedule. All phases of the production process will be addressed under creative, financial, and deadline benchmarks. Note: This course must be completed with a minimum final grade of 25 in order to meet degree requirements
Click here for course fees.

Pre-Requisites

[[IM-320]].

IM-392. INTEGRATIVE MEDIA PROJECT II
Credits: 3

Students will initiate new or continue team-oriented integrative media productions. The production process will be optimized to continue the experience of industry scenarios. Expanded business practices and production techniques will build upon prior skill sets. Note: This course must be completed with a minimum final grade of 25 in order to meet degree requirements
Click here for course fees.

Pre-Requisites

[[IM-391]].

IM-399. COOPERATIVE EDUCATION
Credits: 1-6

Pre-Requisites

Sophomore standing, minimum 2.0 cumulative GPA, consent of academic advisor, and approval of placement by the department chairperson.

IM-400. INTEGRATIVE MEDIA PORTFOLIO CAPSTONE
Credits: 3

As the capstone of the IM curriculum, this course will focus on the compilation of visual materials produced throughout the set of courses, as necessary in the job submission process. Creating a self 'brand' will be a concentration, along with the compilation of written works, flatbook, and reel. Understanding the perspective of the employer will be heavily discussed and the various positions, procedures, and environments that produce IM products. Note: This course must be completed with a minimum final grade of 25 in order to meet degree requirements.
Click here for course fees.

Pre-Requisites

[[IM-391]].

IA. INTERCOLLEGIATE ATHLETICS

IA-101. INTERCOLLEGIATE ATHLETICS
Credits: no

This course is limited to students participating in intercollegiate athletics during their sport season. This course may be repeated.

IS. INTERNATIONAL RELATIONS

IS-380. INTERNATIONAL STUDIES SENIOR PROJECT
Credits: 3

This course is the capstone experience for International Studies majors. Students will coordinate the writing of a capstone with a faculty member from an International Studies content area. Throughout the semester, the student will work closely with that faculty member to gather data and write a formal paper. The student will present the findings in a public forum to content-area faculty and students.

Pre-Requisites

Senior standing, permission of the instructor.

LDR. LEADERSHIP

LDR-201. INTRODUCTION TO LEADERSHIP
Credits: 3

The introductory course in the Leadership Studies major provides a general overview of the field of leadership, various definitions, models and theories of leadership, as well as an opportunity for students to understand, reflect, and practice leadership in the their environment. In addition, the Introduction to Leadership course will provide students with a basic introduction to leadership skills, provide opportunities to apply the leadership learning, and encourage students to learn more about the field by taking upper level courses.

LDR-202. ADVANCED LEADERSHIP THEORY AND PRACTICE
Credits: 3

This course is designed to build upon fundamental leadership theory and further explore historical, classic, and contemporary leadership theories, models and perspectives within a variety of contexts. The course addresses the use and usefulness of various leadership styles and models in the decision-making process. Emphasis is placed on the student's personal growth and development. Through a series of self-assessments, students explore their personal leadership style. The class includes presentations and projects focused on increasing leadership skills.

LDR-461. CAPSTONE IN LEADERSHIP
Credits: 3

This course is designed to provide a capstone experience in which students apply their accumulated knowledge, skills and abilities in leadership. The course will include both an in-class component and a cooperative education (see Cooperative Education section of this Bulletin for placement procedures), independent study, and/or an experiential component.

MGT. MANAGEMENT

MGT-209. BUSINESS CORRESPONDENCE AND REPORTS
Credits: 3

An emphasis on written communications: practice in writing major classification of business letters; persuasive requests and refusals; and inquiry, order, sales, application, credit, collection, and goodwill letters. Investigative techniques of research and analytical report writing.

MGT-251. MANAGEMENT OF ORGANIZATIONS AND PEOPLE
Credits: 3

Introduction to the theory and practice of managing organizations, including planning, organizing, and controlling. Interdisciplinary in nature, social and ethical dimensions of managing are examined.

Pre-Requisites

Either ACC, BA, ENT 151 or BA 153

MGT-257. MANAGEMENT INFORMATION SYSTEMS
Credits: 3

This course introduces the fundamental concepts underlying the design, implementation, control, and evaluation of business-oriented computer based information systems, office automation, information reporting, and decision making.

Pre-Requisites

[[ACC-162]], [[BA-119]], [[FIN-240]]

MGT-352. PRODUCTION AND OPERATIONS MANAGEMENT
Credits: 3
Terms Offered: Spring

Principles of decision-making, systems design, introduction to quantitative tools of analysis, and fundamentals of production, inventory, financial, and distribution management.

Pre-Requisites

[[BA-319]] and [[MGT-251]].

MGT-353. HUMAN RESOURCE MANAGEMENT
Credits: 3
Terms Offered: Fall

This course focuses on introducing the student to the theories, practices, problems, and legislation relevant to attracting, selecting, developing, compensating, and effectively using human resources in organizations.

Pre-Requisites

[[MGT-251]].

MGT-354. ORGANIZATIONAL BEHAVIOR
Credits: 3

A behavioral science approach to understanding individual, formal, and informal group behavior, macro- and micro-organizational structures, motivation and leadership theories, group influences, conflicts, decision-making, and communication, with emphasis on behavioral science applications in developing organizational effectiveness.

Pre-Requisites

[[MGT-251]].

MGT-356. THE SOCIAL RESPONSIBILITY OF BUSINESS
Credits: 3

A course dealing with the problems faced by managers in responding to issues such as the kinds and extent of social responsibility to be assumed by businesses, employee rights, consumerism, and the balance of public and private interests.

Pre-Requisites

[[MGT-251]] and junior standing.

MGT-357. BUSINESS TRANSFORMATIONS IN THE DIGITAL ECONOMY
Credits: 3

This course is designed to help students understand how the digital economy forces companies to rethink their business strategies--and architect processes, products, and information differently. Topics will allow for the development of problem solving abilities using business analytics and intellectual curiosity using radical openness in the workplace. The course content will incorporate cases in business, and it will seek to create an understanding of big data, culture and ubiquitous technologies. Students will also understand how to thinking critically and to make decisions using internal and external sources of data.

Pre-Requisites

[[ACC-162]], [[BA-119]], [[FIN-240]]

MGT-358. INTERNATIONAL BUSINESS
Credits: 3

An introduction to the field of international business. Topics include the empirical dimensions of the world economy, business enterprise in international trade, trade channels, effects of economic, political, and social environment on international management problems of international operations, and the role of government in fostering international business. A substantial amount of writing is required.

Pre-Requisites

[[MGT-251]] and senior standing.

MGT-397. SEMINAR
Credits: 1-3

MKT. MARKETING

MKT-221. MARKETING
Credits: 3
Terms Offered: Fall,Spring,Summer

An introduction to the planning and activities of marketing. Emphasis on budgeting, product conception and development, pricing, distribution channels, and promotion.

Pre-Requisites

[[BA-152]] or [[BA-153]] with a minimum grade of 2.0

MKT-322. ADVERTISING
Credits: 3
Terms Offered: Fall,Spring

A managerial analysis of the decisions involved in advertising. Topics include research, ethics, campaign design, copy, art, media, budgeting, and effectiveness.

Pre-Requisites

[[MKT-221]] with a minimum grade of 2.0

MKT-324. RETAILING
Credits: 3
Terms Offered: Fall

A basic course that discusses opportunities in retailing, types of retail institutions, problems of store policy and store location, study of organizational structure of department stores, and organization and functions of all store divisions.

Pre-Requisites

[[MKT-221]] with a minimum grade of 2.0

MKT-326. THE SELLING PROCESS
Credits: 3
Terms Offered: Fall

Examines the buyer-seller relationship process of marketing products and services to consumers and organizations. Emphasis is placed on sales techniques, presentation styles, and sales management skills appropriate to the business interaction.

Pre-Requisites

[[MKT-221]] with a minimum grade of 2.0

MKT-327. SEMINAR IN SOCIAL MEDIA MARKETING
Credits: 3
Terms Offered: Fall

This course provides an in-depth examination of social media marketing, which is the use of social media by marketers to increase brand awareness, identify key audiences, generate leads and build meaningful relationships with customers. Students will learn how to utilize new and constantly updated social media marketing strategies for businesses, and lead discussion of implementing a successful business strategy for Facebook, Instagram, Twitter, Snapchat, Pinterest, LinkedIn and etc.

MKT-328. CONSUMER BEHAVIOR
Credits: 3
Terms Offered: Spring

This course presents a survey and integration of concepts and theories that help explain or predict consumer behavior. Emphasis is on the implications of this information for marketing planning.

Pre-Requisites

[[MKT-221]] with a minimum grade of 2.0

MKT-357. DIGITAL MARKETING
Credits: 3
Terms Offered: Fall

This course focuses on principles of digital marketing from botb business and consumer perspectives. More than ever before, marketers are responsible for getting results and for generating the appropriate metrics to determine whether their objectives were achieved. This course teaches students critical skills such as search engine optimization, website analytics, pay-per-click advertising, and social media marketing. It provides students with solid experience in creating market data-driven strategies for the future success of a digital business.

Pre-Requisites

[[MKT-221]] with a minimum grade of 2.0

MKT-419. MARKETING RESEARCH ANALYTICS
Credits: 3

This course provides an introduction to marketing research and data analytics. This course examines the role of marketing research in the firm, global and ethical dimensions of research, different research designs, data collection procedures, sampling issues, fundamental (and some more advanced) data analysis techniques, and so on. A practical approach is adopted in this course. In addition to learning fundamental constructs and principles of marketing research, students will focus on learning tools and skills necessary for solving business problems and exploiting business opportunities.

Pre-Requisites

MKT-462. MARKETING INTERNSHIP
Credits: 3
Terms Offered: Fall,Spring,Summer

The marketing internship is designed to provide students with advanced instruction and professional experience. Through a work-based learning experience, students gain an understanding of the internship site's work, as well how it potentially relates to their academic study in a real business setting.

Pre-Requisites

[[MKT-221]] and [[MGT-251]] with a minimum grade of 2.0

MTH. MATHEMATICS

MTH-198, MTH-289, MTH-398, MTH-498. TOPICS IN MATHEMATICS
Credits: Variable

A study of topics of special interest. It may be a continuation of intensive study of topics begun in the upper-level courses in analysis, topology, algebra, and probability. May be repeated for credit for a different topic.

Pre-Requisites

Varies with topic

MTH-94. COLLEGE ALGEBRA
Credits: 3

Designed for students who need to review basic algebra before taking [[MTH-100]] or [[MTH-150]]. Topics include polynomials, solution of equations and inequalities, exponents and radicals, graphing, and solution of systems of equations. Offered every fall.

MTH-100. PRECALCULUS
Credits: 3

A course in advanced algebra and trigonometry designed to prepare students for calculus. Topics include functions, inverse functions, logarithms, exponentials, and trigonometry.

Pre-Requisites

MTH 94 with grade of 2.0 or better or meet Department of Mathematics, Physics and Computer Science placement criteria.

MTH-101. SOLVING PROBLEMS USING MATHEMATICS
Credits: 3

An introduction to the methodology of mathematical modeling as a technique in working towards the solution to real world problems. In an effort for the non-specialist to gain an appreciation of the use of mathematics in our society, topics are selected from among the following: basic voting theory, fair division schemes, routing problems, population growth, and descriptive statistics and probability.

MTH-103. MATHEMATICS FOR ELEMENTARY SCHOOL TEACHERS
Credits: 3

A study of the theory of arithmetic, structure of the number systems, and other topics relevant to the teaching of mathematics in elementary schools. Offered every fall.

Pre-Requisites

Admission to the Teacher Education Program or consent of the instructor.

MTH-104. MATHEMATICS FOR ELEMENTARY SCHOOL TEACHERS II
Credits: 3

A continuation of [[MTH-103]]. Topics include elementary probability, statistics, and geometry. Offered every spring.

Pre-Requisites

Admission to the Teacher Education Program or consent of the instructor.

MTH-111. CALCULUS I
Credits: 4

Calculus of functions of one variable. Topics include functions, limits and continuity, derivatives and integrals. Course will focus on applying conceptual aspects of calculus to modeling and solving problems from across the sciences and engineering.

Pre-Requisites

[[MTH-100]] with a grade of 2.0 or better OR meet Department of Mathematics, Physics and Computer Science placement criteria.

MTH-112. CALCULUS II
Credits: 4

A continuation of [[MTH-111]]. Topics include inverse functions, techniques of integration, applications of the integral, and infinite sequences and series.

Pre-Requisites

[[MTH-111]] with grade of 2.0 or better

MTH-114. CALCULUS AND MODELING FOR THE BIOLOGICAL AND HEALTH SCIENCES
Credits: 4

A continuation of MTH 111 for students in the biological and environmental sciences. Topics include integrals, differential equations and continuous dynamical systems, stochastic models and Markov chains, and discrete and continuous probability models. Course will focus on applying ideas from calculus to modeling and solving problems drawn from the biological and environmental sciences. Major credits cannot be granted for both MTH 112 and MTH 114.

Pre-Requisites

[[MTH-111]] with grade of 2.0 or better

MTH-150. ELEMENTARY STATISTICS
Credits: 3

Elementary statistical inference, with an emphasis on ideas, techniques, and applications in the life, physical, and social sciences. Topics include descriptive statistics, confidence intervals, hypothesis testing, contingency tables, multiple regression, and analysis of variance. Not open to mathematics majors or students with credit in MTH 351.

Pre-Requisites

[[MTH-94]] with grade of 2.0 or better OR meet Department of Mathematics, Physics and Computer Science placement criteria.

MTH-211. INTRODUCTION TO ORDINARY DIFFERENTIAL EQUATIONS
Credits: 4

First-order and linear higher order differential equations; matrices, determinants, and systems of differential equations; numerical and power series methods of solution; the Laplace transform. Offered every fall.

Pre-Requisites

[[MTH-112]] with grade of 2.0 or better

MTH-212. MULTIVARIABLE CALCULUS
Credits: 4

Differential and integral calculus of real and vector valued functions. Topics include continuity, partial differentiation, implicit functions, Taylor's Theorem, gradient, curl, line, surface, and multiple integrals, inverse functions, theorems of Green and Stokes.

Pre-Requisites

[[MTH-112]] with grade of 2.0 or better

MTH-214. LINEAR ALGEBRA
Credits: 3

An axiomatic approach to vector spaces, linear transformations, systems of linear equations, Eigen values, and Eigen vectors. Offered every spring.

Pre-Requisites

[[MTH-112]] with grade of 2.0 or better OR consent of the instructor.

MTH-231. DISCRETE MATHEMATICS I
Credits: 3

An introduction to logic, sets, relations, and counting for students in the mathematical and computing sciences. Topics include: Introduction to symbolic logic; types of proof including direct proof and proof by contradiction; introduction to mathematical induction; elementary set theory including sets, equivalence and partial order relations and functions; basic counting principles including permutations and combinations with and without multiplicity, the Binomial Theorem, an introduction to combinatorial proof and the Pigeonhole Principle; Introduction to recursive definition, solving first-order recurrences using iteration; solving linear homogeneous and non-homogeneous recurrences with constant coefficients.

Pre-Requisites

[[MTH-111]] with grade of 2.0 or better

MTH-232. DISCRETE MATHEMATICS II
Credits: 3

A continuation of [[MTH-231]] providing background in discrete mathematics. Emphasis will be placed on the development of mathematical algorithms and their usage in computer science. Topics include: Introduction to divisibility, the integers, and the Euclidean Algorithm; growth rates of functions, big OH notation and an introduction to algorithm analysis including analyzing iterative and recursive algorithms; basics of graph theory including paths, cycles, graph isomorphism, and graph colorings; introduction to greedy algorithms and their use; trees, spanning trees, binary trees and related algorithms; introduction to combinatorial circuits and Boolean algebra, introduction to finite state machines.

Pre-Requisites

[[MTH-231]] with grade of 2.0 or better

MTH-234. FINANCIAL MATHEMATICS
Credits: 3

This is an introductory course in Financial Mathematics. students will learn about the different types of interest (simple interest, discount interest, compound interest), annuities, debt retirement methods, investing in stocks and bonds. If time is permissible, more advanced topics will also be covered.

Pre-Requisites

[[MTH-100]] with grade of 2.0 or better or consent of the instructor.

MTH-302. INTRODUCTION TO HIGHER MATHEMATICS
Credits: 3

A continuation of [[MTH-231]] which provides foundational background for upper-level courses in pure mathematics. Topics include advanced studies of relations including a review of equivalence relations, an introduction to partial order and total order relations; properties of the integers including divisibility, the notion of congruence, the Euclidean Algorithm, and the Fundamental Theorem of Arithmetic; properties of the real number system including axioms for the real numbers, subsets of the real number system (including the integers, rational numbers, and irrational numbers), the completeness of the real number system; properties of sets and functions including cardinality, countable vs uncountable sets, the cardinal hierarchy of infinite sets and the Continuum Hypothesis.

Pre-Requisites

[[MTH-231]] with a grade of 2.0 or higher

MTH-303. THE TEACHING OF MATHEMATICS IN MIDDLE LEVEL AND SECONDARY SCHOOLS
Credits: 4

This course deals with educational perspectives that pertain to the teaching of mathematics at the middle and secondary levels (grades 4 through 12). Topics of discussion include recommendations by the National Council for Teachers of Mathematics (NCTM) regarding instructional methods, assessment, techniques, and curricular issues. The course includes a 40-hour practicum. Offered in the fall semester of odd-numbered years.

Pre-Requisites

MTH 111, Junior or Senior in Mathematics or Middle-Level Education, and admission to the Teacher Education Program.

MTH-311. REAL ANALYSIS
Credits: 4

A rigorous study of the topology of the real line, limits, continuity, differentiation, integration, and series of functions. Offered in the fall semester of even-numbered years.

Pre-Requisites

[[MTH-302]] or consent of the instructor.

MTH-314. COMPLEX ANALYSIS
Credits: 3

Complex functions, limit, continuity, analytic functions, power series, contour integration, Laurent expansion, singularities, and residues. Offered when demands warrants.

Pre-Requisites

[[MTH-212]] or consent of the instructor.

MTH-331. ABSTRACT ALGEBRA I
Credits: 4

A rigorous study of elementary number theory, groups, rings, and fields. Offered in the fall semester of odd-numbered years.

Pre-Requisites

[[MTH-302]] or consent of the instructor.

MTH-343. GEOMETRY
Credits: 3

A study of selected topics from Euclidean and non-Euclidean geometry. Offered in the fall semester of even-number years.

Pre-Requisites

[[MTH-302]] or consent of the instructor.

MTH-351. PROBABILITY AND MATHEMATICAL STATISTICS I
Credits: 3

Random variables, probability distributions, expectation and limit theorems, introduction to confidence intervals and hypotheses testing. Offered every fall.

Pre-Requisites

[[MTH-112]] or consent of the instructor.

MTH-352. PROBABILITY AND MATHEMATICAL STATISTICS II
Credits: 3

Hypothesis testing, non-parametric methods, multivariate distributions, introduction to linear models. Offered in the spring semester of odd-numbered years when demand warrants.

Pre-Requisites

[[MTH-351]] or consent of the instructor.

MTH-353. ACTUARIAL MATHEMATICS
Credits: 3
Terms Offered: On Demand

Actuarial science is the discipline that applies mathematical and statistical methods to assess risk in the insurance and finance industries. Actuarial science includes a number of interrelating subjects, including probability and statistics, finance, and economics. This course will provide basic aspects of the theory of insurance, concentrating on the part of this theory related to life insurance.

Pre-Requisites

[[MTH-351]] or consent of the instructor.

MTH-354. STATISTICAL METHODOLOGY
Credits: 3

This course emphasizes applications, using statistical computer packages, such as BMDP, SPSS, and JMP, and real data sets from a variety of fields. Topics include estimation and testing, stepwise regression, analysis of variance and covariance, design of experiments, contingency tables, and multivariate techniques, include logistic regression. Offered in the spring semester of even-numbered years when demand warrants.

Pre-Requisites

[[MTH-150]] or [[MTH-351]] or consent of the instructor.

MTH-356. ACTUARIAL P EXAM PREPARATION
Credits: 1
Terms Offered: On Demand

This is a seminar course with the aim of helping students prepare for the actuarial exams as needed.

Pre-Requisites

[[MTH-351]]

MTH-361. PARTIAL DIFFERENTIAL EQUATIONS
Credits: 3

Partial differential equations and boundary value problems, inner product spaces, orthogonal functions, eigenvalue problems, Sturm-Liouville equations, Fourier series, Fourier transforms, Green's functions, and classical equations of engineering and physics. Offered fall of even years.
Click here for course fee.

Pre-Requisites

[[MTH-211]] & [[MTH-212]] or consent of the instructor

MTH-362. ADVANCED CALCULUS
Credits: 3

Topics from advanced calculus including matrix representation of differentials and the multivariable chain rule, vector calculus, curvilinear coordinates, tensors, change of variables in higher dimensions, improper multiple integrals, applications of line and surface integrals, differential forms and the general Stokes theorem, potential theory, and Taylor's formula for functions of several variables. Offered Fall of odd years.
Click here for course fee.

Pre-Requisites

[[MTH-212]]

MTH-363. OPERATIONS RESEARCH
Credits: 3

A survey of operations research topics such as decision analysis, inventory models, queuing models, dynamic programming, network models and linear programming. Cross-listed with [[CS-363]]. Offered in the spring semester of odd-numbered years when demand warrants.
Click here for course fee.

Pre-Requisites

[[MTH-112]] and [[CS-125]].

MTH-364. NUMERICAL ANALYSIS
Credits: 3

Numerical techniques for solving equations, interpolation and function approximation, numerical integration, and differentiation, and solution of differential equations. Error analysis and applications. Cross-listed with [[CS-364]]. Offered spring of odd-numbered years.

Pre-Requisites

[[MTH-211]]and [[CS-125]] (or equivalent programming experience).

MTH-365. NUMERICAL LINEAR ALGEBRA
Credits: 3

Direct and iterative methods for the solution of systems of linear equations, matrix decompositions, computation of eigenvalues and eigenvectors, and relaxation techniques. The theoretical basis for error analysis, including vector and matrix norms. Applications such as least squares and finite difference methods. Offered spring semester of even-numbered years.
Click here for course fee.

Pre-Requisites

[[MTH-214]] and [[CS-125]] (or equivalent programming experience)

MTH-391. SENIOR SEMINAR
Credits: 1

Presentations and discussions of selected topics in mathematics, conducted by students and faculty.

Pre-Requisites

[[MTH-311]] or [[MTH-331]] and senior standing in mathematics.

MTH-392. SENIOR SEMINAR
Credits: 2

Presentations and discussions of selected topics in mathematics, conducted by students and faculty.

Pre-Requisites

[[MTH-311]] or [[MTH-331]] and senior standing in mathematics.

MTH-397. SEMINAR
Credits: 1-3

Presentations and discussions of selected topics.

Pre-Requisites

Approval of the department chairperson.

MTH-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experiences, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. See the Cooperative Education section of this bulletin for placement procedures. Requirements: Sophomore standing; minimum 2.0 cumulative GPA; consent of the academic advisor; and approval of placement by the department chairperson.

MTH-413. FUNCTIONS OF SEVERAL VARIABLES
Credits: 3

A modern treatment of the calculus of functions of several real variables. Topics include Euclidean spaces, differentiation, integration of manifolds leading to the classical theorems of Green and Stokes. Offered when demand warrants.

Pre-Requisites

[[MTH-214]] and [[MTH-311]].

MTH-432. ABSTRACT ALGEBRA II
Credits: 3

A continuation of [[MTH-331]]. Polynomial rings, ideals, field extensions, and Galois Theory. Offered when demand warrants.

Pre-Requisites

[[MTH-331]].

MTH-442. TOPOLOGY
Credits: 3

Metric spaces, topological spaces, countability and separation axioms, compactness, connectedness, product spaces. Offered when demand warrants.

Pre-Requisites

[[MTH-311]] or consent of the instructor.

MTH-470. READING COURSE
Credits: 1-3

Requirements: Senior standing in mathematics and approval of the department chairperson.

ME. MECHANICAL ENGINEERING

ME-140. SCIENTIFIC PROGRAMMING
Credits: 3

This course presents an introduction to computer programming with an emphasis on the techniques needed for data analysis and numerical problem solving for scientific and engineering applications. Basic programming idioms are presented including control structures, data types, methods for handling input and output as well as numerical methods such as array computing and vectorization. Emphasis is placed on proper software engineering practice as well as data analysis and presentation.

Click here for course fees.

Co-Requisites

[[MTH-111]] concurrent or before

ME-175. MACHINING
Credits: 1

Familiarizing with traditional machining processes and measuring equipment used in manufacturing. Hands-on experience with traditional and numerical control (NC) machines; various manufacturing processes and fundamentals of metrology.
Click here for course fees.

ME-180. CADD LAB
Credits: 1

An introduction to the symbolic and visual languages used in the various engineering fields. The use of the computer in design and drafting and familiarization with various software packages in the CADD (Computer Aided Design and Drafting) laboratory. Blueprint reading and printed circuit layouts. Emphasis will also be placed on the representation and interpretation of data in graphical form as well as the fundamentals of 2-dimensional and 3-dimensional graphic formats.
Click here for course fees.

ME-215. MANUFACTURING PROCESSES
Credits: 3

An introduction to manufacturing which examines traditional processes such as metal forming and casting and advanced manufacturing processes associated with thin film deposition, microfabrication and piezoelectric devices. Quality assurance and quality control issues in manufacturing.

Pre-Requisites

[[ME-232]]

ME-231. STATICS
Credits: 3

Statics of particles, including resolution of forces into components, vector sums, and concurrent force systems. Statics of rigid bodies and the study of moments. Equilibrium of bodies in two- and three-dimensions and determination of reactions. Analysis of trusses and frames. Determination of centroids and moments of inertia.

Pre-Requisites

[[PHY-201]]

Co-Requisites

[[MTH-112]] concurrent or before
[[ME-180]] concurrent or before

ME-232. STRENGTH OF MATERIALS
Credits: 3

Analysis of statically determinate and indeterminate structural systems; computation of reactions, shears, moments, and deflections of beams, trusses, and frames. Bending and torsion of slender bars; buckling and plastic behavior.

Pre-Requisites

[[ME-231]], [[ME-180]], [[MTH-112]], and [[EGR-200]] or [[CHM-115]].

ME-234. DYNAMICS
Credits: 3

This course continues the development of Newtonian mechanics with application to the motion of free bodies and mechanisms. Topics include rectilinear motion, vector calculus, particle motion, inertial and rotating reference frames, rigid body motion, rotational dynamics, linear and rotational momentum, work and kinetic energy, virtual work and collision.

Pre-Requisites

[[ME-231]], [[ME-180]], [[MTH-112]]

ME-312. MANUFACTURING SYSTEM ENGINEERING
Credits: 3

Fundamentals of manufacturing processes and systems. Analytical models of manufacturing processes including metal removal rate, tool wear, setup and tool change times. Analysis and optimization of manufacturing productivity and throughput. Automation and computer control of manufacturing processes.

Pre-Requisites

Instructor permission.

ME-314. INVERSE PROBLEMS
Credits: 3

Inverse problems are very common in engineering where the outputs are known but the inputs are unknown. This course will show how to properly setup a well-posed inverse problem, how to solve matrix inverses, and conduct hands on experiments by creating strain gage based force transducers.
Click here for course fee.

Pre-Requisites

[[ME-333]] or instructor permission.

ME-315. PROGRAMMABLE LOGIC CONTROLLERS
Credits: 3

Introduction to the fundamental concepts and design of programmable logic controllers and systems with emphasis on programmable logic controllers, ladder logic programming, and advanced PLC applications.
Click here for course fee.

Pre-Requisites

Instructor permission.

ME-317. ROBOTICS
Credits: 3

The analysis and design of robots. Class covers the mechanical principles governing the kinematics of robotics. Course topics include forward kinematics and the determination of the closed form kinematic inversion, as well as workspace and trajectory generation. Class also covers the formation and computation of the manipulator Jacobian matrix.

Click here for course fee.

Pre-Requisites

[[EGR-222]] and [[ME-234]]

Co-Requisites

[[MTH-212]] concurrent or before

ME-321. FLUID MECHANICS
Credits: 3

Thermodynamics and dynamic principles applied to fluid behavior and to ideal, viscous and compressible fluids under internal and external flow conditions.

Pre-Requisites

[[ME-231]]

Co-Requisites

[[ME-322]] concurrent or before

ME-322. THERMODYNAMICS
Credits: 3
The fundamental concepts and laws of thermodynamics, thermodynamic properties of perfect and real gases, vapors, solids, and liquids. Applications of thermodynamics to power and refrigeration cycles and flow processes. Development of thermodynamic relationships and equations of state. Review of the first and second laws of physics. Reversibility and irreversibility.

Pre-Requisites
[[MTH-112]]

ME-323. FLUID MECHANICS LABORATORY
Credits: 1
Experiments with and analysis of basic fluid phenomena, hydrostatic pressure, Bernoulli theorem, laminar and turbulent flow, pipe friction, and drag coefficient.
Click here for course fees.

Co-Requisites
[[ME-321]] concurrent or before
[[ME-322]] concurrent or before

ME-324. HEAT TRANSFER
Credits: 3
Fundamental principles of heat transmission by conduction, convection, and radiation; application of the laws of thermodynamics; application of these principles to the solution of engineering problems.

Pre-Requisites
[[ME-321]] and [[MTH-211]]

ME-325. ENERGY SYSTEMS
Credits: 3
Fundamental principles of energy transmission and energy conversion. Comprehension of the physical systems in which the conversion of energy is accomplished. Primary factors necessary in the design and performance analysis of energy systems.

Pre-Requisites
[[ME-322]] or instructor permission.

ME-326. HEAT TRANSFER LABORATORY
Credits: 1
Basic heat transfer modes are demonstrated experimentally. This includes conduction, convection, and radiation of heat as well as fin and heat exchanger.
Click here for course fees.

Pre-Requisites
[[ME-321]]
Co-Requisites
[[ME-324]] concurrent or before

ME-328. COMBUSTION ENGINES
Credits: 3
Investigation and analysis of internal and external combustion engines with respect to automotive applications. Consideration of fuels, carburetion, combustion, detonation, design factors, exhaust emissions and alternative power plants.

Pre-Requisites
[[ME-322]] or instructor permission.

ME-330. VIBRATIONS LABORATORY
Credits: 1
Fees: 115
Experiments that complement vibration theories in ME 332, including spring and damper elements, underdamped vibration, torsional pendulum, resonance, transient and steady-state behaviors, base excitation, rotating unbalance, impulse response, and modal testing.
Click here for course fee.

Pre-Requisites
[[ME-234]], [[MTH-211]]
Co-Requisites
[[ME-332]] concurrent or before

ME-332. VIBRATIONS
Credits: 3
An introductory course in mechanical vibration dealing with free and forced vibration of single and multi-degrees of freedom for linear and nonlinear systems.

Pre-Requisites
[[ME-234]], [[MTH-211]]

ME-333. MACHINE DESIGN
Credits: 3
The first course of a two-course sequence in design of machine elements dealing with theories of deformation and failure, strength and endurance limit, fluctuating stresses, and design under axial, bending, torsional, and combined stresses. A study of column buckling, fasteners, and gears.

Pre-Requisites
[[ME-232]]

ME-335. FINITE ELEMENT METHODS
Credits: 4
Introduction to finite element method for static and dynamic modeling and analysis of engineering systems. Finite element formulation and computer modeling techniques for stress, plane strain, beams, axisymmetric solids, heat conduction, and fluid flow problems. Solution of finite element equation and post processing of results for further use in the design problem.
Click here for course fee.

Pre-Requisites
[[ME-232]]
Co-Requisites
[[MTH-211]] concurrent or before

ME-336. SOLID MECHANICS
Credits: 3

This course is an introduction to continuum mechanics, variational methods, including vectors and tensors, state of stress and compatibility equation, plain stress and strain. Energy Principles and virtual work will be discussed.

Pre-Requisites

[[ME-232]] or instructor permission.

ME-337. MICRO-ELECTRO-MECHANICAL SYSTEMS
Credits: 3

This course explores the principles of MEMS by understanding materials properties, micro-machining, sensor and actuator principles. The student will learn that MEMS are integrated micro-devices combining mechanical and electrical systems, which convert physical properties to electrical signals and, consequently, detection. This course provides the theoretical and exercises the hands-on experience by fabricating a micro-pressure sensor.
Click here for course fees.

Pre-Requisites

Instructor permission.

ME-338. ADVANCED MACHINE DESIGN
Credits: 3

An advanced course in machine design topics that expands upon the concepts of Machine Design ([[ME-333]]). This course goes into more detail of the basic machine fundamentals introduced previously such as levers, belts, pulleys, gears, cams and power screws. Emphasis is also placed on 3D printing and the future of additive manufacturing.

Pre-Requisites

[[ME-333]] or instructor permission.

ME-340. HEATING, VENTILATION AND AIR CONDITIONING
Credits: 3

Introduction of fundamentals of HVAC design and construction. Study of the psychometric process and fundamental calculations and layout of HVAC systems. Calculations of heat loss and heat gain in commercial and residential structures.

Pre-Requisites

[[ME-322]] or instructor permission.

ME-342. ADVANCED MATERIALS SCIENCE
Credits: 3

This course introduces advanced materials for engineers, emphasizing the fundamentals of manufacturing/structure/property/function relationships and applications. Topics include materials selection for machine design components in micro- and nano-scales, biomaterials, nano-composites, and optimized materials for nano-sensors and actuator systems.

Pre-Requisites

[[EGR-200]] or instructor permission.

ME-343. ADDITIVE MANUFACTURING
Credits: 3

An introduction to additive manufacturing, also known as 3-D printing, which is a process of building 3-D objects from a digital file. Emphasis will be placed on both existing and emerging additive manufacturing processes in the context of design, modeling, materials, processing, and applications. This course provides hands-on experience and implements active learning strategies.
Click here for course fees.

Pre-Requisites

[[ME-333]] or instructor permission.

ME-347. THIN FILM MANUFACTURING
Credits: 3

This course explores the principles of micro-devices manufacturing by thin film deposition processing methods. Vacuum deposition technologies such as physical vapor deposition and the electron beam evaporation process will be covered for conductors, resistors, and dielectric thin film depositions. Sol-Gel chemical thin film processing of oxides and piezoelectric materials along with direct circuit manufacturing by photo seeding and electro-less copper deposition will be covered.
Click here for course fees.

Pre-Requisites

Instructor permission.

ME-380. ADVANCED CADD
Credits: 3

An advanced course in Computer-Aided Drafting and Design (CADD) using SolidWorks. This course will introduce topics such as advanced modeling, advanced assemblies, Finite Element Analysis (FEA), sheet metal, and modal analysis.
Click here for course fee.

Pre-Requisites

[[ME-180]] or instructor permission.

ME-384. MECHANICAL DESIGN LABORATORY
Credits: 3

A laboratory for the development of open-ended problems in mechanical systems. Emphasis on experimental performance, data collection, evaluations, analysis, and design. This course provides hands-on experience with strain gauge application, measurement techniques, and analysis of topics in mechanical engineering.
Click here for course fees.

Pre-Requisites

[[ME-333]] and [[ME-335]]

ME-391. SENIOR PROJECTS I
Credits: 1

Design and development of selected projects in the field of mechanical engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A detailed progress report is required.
Click here for course fees.

Pre-Requisites

Senior standing in Mechanical Engineering or departmental permission.

ME-392. SENIOR PROJECTS II
Credits: 2

Design and development of selected projects in the various fields of mechanical engineering under the direction of a staff member. Technical as well as economic factors will be considered in the design. A professional paper and detailed progress reports are required. This is a continuation of [[ME-391]]. An open-forum presentation and discussion of the professional paper are required.
Click here for course fees.

Pre-Requisites

[[ME-391]]

ME-396. INDEPENDENT RESEARCH
Credits: 1-3

Independent study and research for advanced students in the field of mechanical engineering under the direction of a faculty member. A research paper and/or design project and/or conference presentation may be required.

Pre-Requisites

Instructor permission.

ME-397. SEMINAR
Credits: 1-3

Presentations and discussions of selected topics.

Pre-Requisites

Instructor permission.

ME-398. TOPICS IN MECHANICAL ENGINEERING
Credits: 1-3

Selected topics in the field of mechanical engineering.
Click here for course fees.

Pre-Requisites

Instructor permission.

ME-399. COOPERATIVE EDUCATION
Credits: 0-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experiences, students are required to submit biweekly reports, a final report and present to an audience of peers and faculty. The co-op option for credit can only be taken one time for either 3 or 6 credits.

Pre-Requisites

Instructor permission.

MIL. MILITARY SCIENCE (ARMY ROTC)

MIL-100. PHYSICAL FITNESS TRAINING
Credits: 1

U.S. Army Master Fitness trainers supervise a modern fitness program based on the latest military fitness techniques and principles. The classes are conducted on Monday through Friday at the King's College Scandlon Fitness Center and are one hour each in duration.

MUS. MUSIC

MUS-100. - 400. APPLIED PERFORMANCE
Credits: 1 or 2

Individual instruction offered in all keyboard, band, and orchestral instruments, guitar, and voice.
MUS 100 - Freshman level
MUS 200 - Sophomore level
MUS 300 - Junior level
MUS 400 - Senior level
Click here for course fee for 1 credit.
Click here for course fee for 2 credits.

Pre-Requisites

Permission of the instructor.

MUS-101. INTRODUCTION TO MUSIC I
Credits: 3

An introduction to the materials of music and their interrelationships, with an emphasis on developing active listening skills, recognizing and comparing the elements of differing musical styles, and exploring cultural contexts and differing functions of music in diverse groups. Three subtopic areas are offered:

- Western Art Music – An exploration of the traditional Western classical music canon.
- Music in the United States – A broad approach that examines both American vernacular music (blues, jazz, folk, rock, pop, etc.) and the Western classical music canon.
- The History of American Popular Music – An in-depth exploration of American popular music.

MUS-102. MUSIC FUNDAMENTALS
Credits: 3

This course gives students a solid grounding in the fundamentals of reading and performing music. No previous experience with music is required. Offered every fall.

MUS-103. MUSIC THEORY I
Credits: 3

This course presents fundamental materials and structures of music theory. Theoretical, aural, and keyboard skills are developed through practice and study of music examples. Offered every spring.

Pre-Requisites

Familiarity with music notation or [[MUS-102]].

MUS-104. MUSIC THEORY II
Credits: 3

A continuation of [[MUS-103]] (Music Theory I). This course presents materials and structures of music theory. Theoretical, aural, and keyboard skills are developed through practice and study of music examples.

Pre-Requisites

[[MUS-103]] or placement by a diagnostic exam.

MUS-119. - 419. VOICE STUDIO CLASS
Credits: 0

Voice Studio Class provides students a structured environment in which to present live performances of vocal repertoire in collaboration with an accompanist. Students receive feedback on their presentations by the instructor, who delivers coachings in a masterclass format. Required for MUT majors.
MUS 119 - Freshman level
MUS 219 - Sophomore level
MUS 319 - Junior level
MUS 419 - Senior level

Co-Requisites

MUS 100/200/300/400

MUS-121. WILKES CIVIC BAND
Credits: 0 or 3

The Wilkes University Civic Band provides a large symphonic band experience, and is open to the University student community and qualified local community members, by audition. Literature is chosen from the standard band repertoire, and the ensemble performs a minimum of two formal concerts per year. May be repeated for credit.

Pre-Requisites

Permission of the instructor.

MUS-122. CHAMBER WINDS
Credits: 1

Students will study, rehearse and perform a variety of large and small ensemble works for chamber wind ensemble. May be repeated for credit.

Pre-Requisites

Permission of the instructor.

MUS-123. MARCHING COLONELS
Credits: 2

The Wilkes University Marching Colonels Marching Band provides an opportunity for rehearsal, study, and performance of a marching band field show presented at home football games and select on and off-campus performances. Members must commit to a one week band camp before classes commence, perform at all home football games, and attend all rehearsals. May be repeated for credit. Offered every fall.

MUS-125. UNIVERSITY CHORUS
Credits: 0-3

The Wilkes University Chorus is a large mixed choral ensemble in which students develop musical skills and artistry through the regular rehearsal, discussion, and performance of a wide variety of choral repertoire. Membership open to all members of the University and surrounding community, by audition. May be repeated for credit.

Pre-Requisites

Permission of the instructor.

MUS-126. CHAMBER SINGERS
Credits: 0.5

The Wilkes University Chamber Singers provides students an opportunity to practice advanced ensemble skills through the regular rehearsal and performance of a wide variety of primarily a cappella choral repertoire. Membership is open to any student member of the University Chorus. May be repeated for credit.

Pre-Requisites

Permission of the instructor.

MUS-127. JAZZ ENSEMBLE
Credits: 0 or 3

Open to all members of the University community. The ensemble rehearses and presents performances of literature encompassing a wide range of jazz styles and techniques. May be repeated for credit.

Pre-Requisites

Permission of the instructor.

MUS-128. CHAMBER PERFORMANCE
Credits: 1

Students will study and publicly perform chamber literature appropriate to their instruments. Coaching and supervision by faculty members, as assigned. May be repeated for credit.

Pre-Requisites

Permission of the instructor.

MUS-132. CHAMBER ORCHESTRA
Credits: 0 or 3

Students will study, rehearse and perform a variety of large and small ensemble works for chamber orchestra. May be repeated for credit.

Pre-Requisites

Permission of the instructor.

MUS-135. FLUTE ENSEMBLE
Credits: 1

Students will study, rehearse and perform a variety of large and small ensemble works for flute ensemble. May be repeated for credit.

Pre-Requisites

Permission of the instructor.

MUS-138. PERCUSSION ENSEMBLE
Credits: 1

Students will study, rehearse and perform a variety of large and small ensemble works for percussion ensemble. May be repeated for credit.

Pre-Requisites

Permission of the instructor.

MUS-198. TOPICS
Credits: 3

A study in topics of special interest not extensively treated in regularly offered courses.

MUS-210. MUSIC HISTORY I: ANCIENT THROUGH BAROQUE
Credits: 3

A study of the history of music and the genres, styles, and forms of the stylistic periods of musical composition, Ancient through Baroque, and the movements, eras, and themes associated with these periods. Offered in alternate years, in the fall.

Pre-Requisites

[[MUS-103]] or permission of the instructor.

MUS-211. MUSIC HISTORY II: CLASSICAL THROUGH TWENTIETH CENTURY
Credits: 3

A study of the history of music and the genres, styles, and forms of the stylistic periods of musical composition, Classical through 21st Century, and the movements, eras, and themes associated with these periods. Offered in alternate years, in the fall.

Pre-Requisites

[[MUS-103]] or permission of the instructor.

MUS-395. - 396 INDEPENDENT RESEARCH
Credits: 1-3

Independent study and research for advanced students in music under the direction of a faculty member. A research paper at a more substantial level beyond a term paper is required.

Pre-Requisites

Approval of the department chairperson.

NSG. NURSING

NSG-117. BASIC LIFE SUPPORT RENEWAL
Credits: 1

This hybrid course combines online learning and cognitive evaluation with hands-on skills practice and psychomotor evaluation in accordance with the standards of the American Heart Association's (AHA) Core Curriculum. Students who successfully complete this course will receive AHA course completion cards for both Basic Cardiac Life Support for the Heath Care Provider and Heartsaver First Aid.
Click here for course fee.

NSG-200. PRINCIPLES OF NORMAL NUTRITION
Credits: 3
Fees: $32 for non-nursing majors

An introduction of the basic science of human nutrition: principles of normal nutrition, meal planning, computation of diets, physiological, psychosocial, and social effects of food and its constituents; and some local, national, and international nutrition problems.

Pre-Requisites

[[BIO-113]], [[BIO-115]], [[BIO-116]], [[CHM-111]], [[ENG-101]] and
[[PSY-101]]

Co-Requisites

[[NSG-214]]

NSG-210. PRINCIPLES OF NURSING: INDIVIDUAL, FAMILY, AND COMMUNITY
Credits: 6

This course introduces the student to the profession of nursing. Use of the nursing process is emphasized in meeting the basic human needs of clients within families and their communities. Nursing theory is correlated with clinical practice in the Clinical Nursing Simulation Center and selected clinical agencies. Hours weekly: 4 hours of class and 6 hours of clinical practice.
Click here for course fees.

Pre-Requisites

[[NSG-200]], [[NSG-214]]

Co-Requisites

[[NSG-211]], [[NSG-215]]

NSG-211. PHYSICAL ASSESSMENT
Credits: 3

This course is designed to facilitate the integration of physical assessment skills as an essential element of the nursing process. The components of physical assessment, including the health history and physical examination, are organized to allow the student to proceed from an assessment of the overall function of a client to the more specific functions of each body system. Requirement: Sophomore standing in the Nursing program and online Accelerated Baccalaureate Program for Second Degree Students.
Click here for course fees.

Co-Requisites

[[NSG-210]], [[NSG-215]] or [[NSG-330]]

NSG-213. NURSING CARE OF THE PSYCHIATRIC MENTAL HEALTH CLIENT: INDIVIDUAL, FAMILY, AND COMMUNITY
Credits: 4

The nursing process is utilized in assisting adults and their families within their communities to achieve optimum health and to resolve selected problems in mental health and psychiatric nursing. Nursing theory is correlated with clinical practice in a variety of health care settings. Hours weekly: 2 hours of class, 6 hours of clinical practice.

Pre-Requisites

[[NSG-210]], [[NSG-211]], [[NSG-215]]

Co-Requisites

[[NSG-235]], [[NSG-236]], [[NSG-342]]

NSG-214. PATHOPHYSIOLOGY FOR THE PROFESSIONAL NURSE
Credits: 3

This course focuses on altered cell functioning resulting in deviations from homeostasis. Topics of study include principles of homeostasis and the immune, cardiopulmonary, renal, nervous, gastrointestinal, hematological, musculoskeletal, and endocrine systems. The student's ability to relate this to the individual's need for care is emphasized. Pathological alterations in health at the systems level and implications for nursing care are emphasized. Requirement: Sophomore standing in the Nursing program.

Pre-Requisites

[[BIO-113]], [[BIO-116]], [[ENG-101]]
[[PSY-101]]

Co-Requisites

[[NSG-200]]

NSG-215. PHARMACOTHERAPEUTICS I
Credits: 1

Principles of pharmacology and specific drug groups are explored. An emphasis is placed on pharmacotherapeutics, pharmacokinetics, and pharmacodynamics.

Pre-Requisites

[[NSG-200]], [[NSG-214]]

Co-Requisites

[[NSG-210]], [[NSG-211]]

NSG-217. BASIC LIFE SUPPORT RENEWAL
Credits: 1

This hybrid course combines online learning and cognitive evaluation with hands-on skills practice and psychomotor evaluation in accordance with the standards of the American Heart Association's (AHA) Core Curriculum for renewal. Students who successfully complete this course will receive a renewal of AHA course completion cards for both Basic Cardiac Life Support for the Health Care Provider and Heartsaver First Aid.
Click here for course fee.

Pre-Requisites

[[NSG-117]]

NSG-224. PHARMACOTHERAPEUTICS AND CLINICAL DECISION-MAKING IN NURSING
Credits: 3

(Accelerated Bachelors Program online students only).
This course is designed to assist students to understand the multidisciplinary science of pharmacology based on human systems. Content includes drug classifications, indications, adverse effects and contraindications, age-related variables, dosages, and nursing implications. Using critical thinking skills related to drug therapy, clinical decision-making is developed.

Pre-Requisites

Acceptance into the Accelerated Bachelors Program.
[[NSG-211]], [[NSG-330]]

Co-Requisites

[[NSG-331]], [[NSG-341]]

NSG-235. MEDICAL SURGICAL NURSING I
Credits: 6
Terms Offered: Fall

The nursing process is utilized in assisting adults and their families within their communities to achieve optimum health and managed selected health problems. Nursing theory is correlated with clinical practice in a variety of health care settings. Hours weekly: 3 hours of class and 9 hours of clinical practice.

Pre-Requisites

[[NSG-210]], [[NSG-211]], [[NSG-215]]

Co-Requisites

[[NSG-213]], [[NSG-236]], [[NSG-342]]

NSG-236. PHARMACOTHERAPEUTICS II
Credits: 1

This course is designed to assist students to understand the multidisciplinary science of pharmacology based on human systems. Content includes drug classification, indications, adverse effects and contraindications, age-related variables, dosages, and nursing implications. Using critical thinking skills related to drug therapy, clinical decision making is developed.

Pre-Requisites

[[NSG-210]], [[NSG-211]], [[NSG-215]]

Co-Requisites

[[NSG-213]], [[NSG-235]], [[NSG-342]]

NSG-237. MEDICAL SURGICAL NURSING II
Credits: 6
Terms Offered: Spring

The nursing process is utilized in assisting adults and their families within their communities to achieve optimum health and manage selected health problems. Nursing theory is correlated with clinical practice in a variety of health care settings. Hours weekly: 3 hours of class and 9 hours of clinical practice.

Pre-Requisites

[[NSG-213]], [[NSG-235]], [[NSG-236]], [[NSG-342]]

Co-Requisites

[[NSG-241]], [[NSG-238]], [[EES-242]]

NSG-238. PHARMACOTHERAPEUTICS III
Credits: 1

This course is designed to assist students to understand the multidisciplinary science of pharmacology based on human systems. Content includes drug classification, indications, adverse effects and contraindications, age-related variables, dosages, and nursing implications. Using critical thinking skills related to drug therapy, clinical decision making is developed.

Pre-Requisites

[[NSG-213]], [[NSG-235]], [[NSG-236]], [[NSG-342]]

Co-Requisites

[[NSG-237]], [[NSG-241]], [[EES-242]]

NSG-239. GERONTOLOGICAL NURSING
Credits: 2

This course will focus on the nursing management of older adults. Contemporary theories of gerontology, theories of aging, physiological / psychological functioning, impact of developmental changes, illness, and dysfunction will be emphasized. The geriatric patient will be examined at various levels – healthy older adult, older adult at risk, the older adult experiencing acute and chronic illness.

Pre-Requisites

[[NSG-242]], [[NSG-340]], [[NSG-321]]

Co-Requisites

[[NSG-325]], [[NSG-345]]

NSG-241. NURSING CARE OF THE CHILD BEARING FAMILY
Credits: 4

The nursing process is utilized in childbearing families within their communities to meet their human needs. Nursing theory is correlated with clinical practice in a variety of health care settings. This course is designated for Women's and Gender Studies (WGS).

Pre-Requisites

[[NSG-213]], [[NSG-235]], [[NSG-236]], [[NSG-342]]

Co-Requisites

[[NSG-237]], [[NSG-238]]

NSG-242. NURSING CARE OF THE CHILD REARING FAMILY
Credits: 4

The nursing process is utilized in assisting families with children within the communities to meet their human needs. Nursing theory is correlated with clinical practice in a variety of health care settings.

Pre-Requisites

[[NSG-237]], [[NSG-238]], [[NSG-241]]

Co-Requisites

[[NSG-321]], [[NSG-340]]

NSG-317. ADVANCED LIFE SUPPORT
Credits: 3

This course covers the essential material for Advanced Cardiac Life Support and Pediatric Advanced Life Support in accordance with the standards of the American Heart Association. Enrolled students are eligible for American Heart Association ACLS and PALS Course Completion Cards at the end of the course.
Click here for course fee.

NSG-321. POPULATION HEALTH
Credits: 3

This course provides a foundation in population health, including community and population assessment, intervention, and evaluation of culturally diverse and vulnerable populations.

Pre-Requisites

[[NSG-237]], [[NSG-238]], [[NSG-241]], [[EES-242]]

Co-Requisites

[[NSG-242]], [[NSG-340]]

NSG-325. PREPARATION FOR PROFESSIONAL PRACTICE
Credits: 2

This course uses a variety of strategies to prepare final semester pre-licensure baccalaureate nursing students for entry into professional nursing practice. Students are assessed for readiness to sit for the NCLEX-RN licensure examination as well as for entry into professional nursing practice in a general health care setting. This course provides students with quantitative analysis of their readiness to pass the NCLEX-RN exam

Pre-Requisites

[[NSG-242]], [[NSG-321]], [[NSG-340]]

Co-Requisites

[[NSG-239]], [[NSG-345]]

NSG-330. NURSING PRACTICE I
Credits: 12

(Accelerated Baccalaureate Program for Second Degree Students)This online course introduces the student to the profession of nursing. Use of the nursing process is emphasized in meeting the human needs of clients identified as individuals, families, and communities. Nursing theory is correlated with clinical practice during the residency in the Clinical Nursing Simulation Center and selected clinical agencies. 12 hours of clinical practice.
Click here for course fees.

Co-Requisites

[[NSG-211]]

NSG-331. NURSING PRACTICE II
Credits: 12

(Accelerated Baccalaureate Program for Second Degree Students, online) Building on the foundation of Nursing, the nursing process is used to assist individuals, families, and communities to achieve optimum health and to resolve selected medical, surgical, and mental health problems. Nursing theory is correlated with clinical practice, and is mastered in a variety of settings. Hours weekly: 7 hours of class; 15 hours of clinical practice.
Click here for course fees.

Pre-Requisites

[[NSG-211]], [[NSG-330]]

Co-Requisites

[[NSG-224]], [[NSG-341]]

NSG-332. NURSING PRACTICE III
Credits: 12

(Accelerated Baccalaureate Program for Second Degree Students, online)This course prepares the student for professional role development in emerging health care delivery systems. The nursing process is utilized in assisting individuals, families, and communities to meet their health needs. Nursing theory is correlated with clinical practice in a variety of health care settings. Hours weekly: 6 hours of class; 18 hours of clinical practice.
Click here for course fees.

Pre-Requisites

[[NSG-224]], [[NSG-331]], [[NSG-341]]

Co-Requisites

[[NSG-342]]

NSG-340. ADVANCED CARE CONCEPTS
Credits: 5

The nursing process is used in assisting adults and their families, within their communities, to achieve optimum health and to resolve complex health problems. Hours weekly: 3 hours of class, 6 hours of clinical practice.
Click here for course fees.

Pre-Requisites

[[NSG-237]], [[NSG-238]], [[NSG-241]], [[EES-242]]

Co-Requisites

[[NSG-242]], [[NSG-321]]

NSG-341. NURSING INFORMATICS
Credits: 3

This course provides information about technology used to communicate, manage information, and support decision making to facilitate the achievement of client healthcare outcomes. The course integrates information related to the areas of nursing science, information management science, and computer science.

Pre-Requisites

[[NSG-242]], [[NSG-321]], [[NSG-340]]
ABSN: [[NSG-211]], [[NSG-330]]

Co-Requisites

[[NSG-239]], [[NSG-325]], [[NSG-345]]
ABSN: [[NSG-224]], [[NSG-331]]

NSG-342. INTRODUCTION TO NURSING RESEARCH
Credits: 3

The research process is examined in this course. Emphasis is placed on studies in nursing that provide a foundation for critical reflection on research reports and application of findings to practice. Designated oral presentation option (OPO). Accelerated students to complete in the third semester.

Pre-Requisites

[[NSG-210]], [[NSG-211]], [[NSG-215]], [[MTH-150]]
Accelerated Students [[NSG-224]], [[NSG-331]], [[NSG-341]]

Co-Requisites

[[NSG-213]], [[NSG-235]], [[NSG-236]]
Accelerated Students [[NSG-332]], [[NSG-342]]

NSG-345. SENIOR PRACTICUM
Credits: 5

This course prepares the student for professional role development in emerging health care delivery systems. The nursing process is utilized in the care of older adult clients and their families within their communities in a variety of settings. Nursing theory is correlated with clinical practice. Hours weekly: 2 hours of class, 9 hours of clinical practice.
Click here for course fees.

Pre-Requisites

[[NSG-242]], [[NSG-321]], [[NSG-340]]

Co-Requisites

[[NSG-239]], [[NSG-325]], [[NSG-341]]

PHA. PHA

PHA-301. & 304. FOUNDATIONS OF PHARMACY PRACTICE I AND II
Credits: 2
Terms Offered: Fall,Spring

The purpose of this two-semester course is to provide the student with the foundational knowledge, skills and attitudes needed to practice pharmacy in the 21st century. In particular, this course will focus on skills (communication, teamwork), attitudes and other content relevant to the practice of pharmacy. The school's team-focused approach to learning is emphasized throughout. This course fulfills experiential requirements and so students will have the opportunity to interact with pharmacists and patients. Requirement: P-1 standing.

PHA-302. , 401, 402, 501, & 502. PHARMACY CARE LAB I - V
Credits: 1 each

This five-semester sequence is designed to develop the student's ability to integrate and apply information as well as practice skills that are taught throughout the curriculum. The use of case studies, role-plays, presentations, and other active-learning strategies engages students in the learning process and requires them to synthesize information at increasing levels of complexity as the student moves through the course sequence. Requirement: P-1, P-2, or P-3 standing, as appropriate for each laboratory.

Pre-Requisites

Pre-requisites:
For [[PHA-401]], pre-requisite is [[PHA-302]]
For [[PHA-402]], pre-requisite is [[PHA-401]]
For [[PHA-501]], pre-requisite is [[PHA-402]]
For [[PHA-502]], pre-requisite is [[PHA-501]]

Co-Requisites

For [[PHA-401]], Co-requisites: [[PHA-421]], [[PHA-423]], and [[PHA-425]]
For [[PHA-402]], Co-requisites: [[PHA-426]], [[PHA-428]], and [[PHA-430]]
For [[PHA-501]], Co-requisites: [[PHA-521]], [[PHA-523]], and [[PHA-525]]
For [[PHA-502]], Co-requisites: [[PHA-526]], [[PHA-528]], and [[PHA-530]]

PHA-308. PHARMACEUTICAL AND HEALTH CARE DELIVERY
Credits: 3

Examination of health and pharmaceutical delivery in the U.S. conducted from a societal perspective. Emphasis is on public policy, economic behavior, and outcomes. Application will be made to various pharmaceutical sectors (e.g., retail, health, systems, manufacturing). Students should gain an understanding of the factors driving transformation of health care delivery and the implications for future pharmacy practice. Lecture: three hours per week. Requirement: P-1 standing or consent of the instructor. Cross-listed with [[PHS-308]].

Pre-Requisites

P1 standing or instructor permission.

PHA-310. CLINICAL RESEARCH AND DESIGN
Credits: 3

In order to apply current research to patient care activities, one must first develop the skills to interpret studies. The purpose of this course is to learn how research studies are designed to answer specific clinical questions, and how the study design is important in interpreting the results of the studies. Students will apply research design concepts and statistical techniques to design, critically analyze, and interpret preclinical, clinical, and economic studies of pharmaceuticals and treatment plans. Lecture: three hours per week.

Pre-Requisites

[[MTH-150]] or equivalent and P-1 standing or consent of the instructor.

PHA-311. & PHA 312 PHARMACEUTICS I & II
Credits: 4

The study and application of physical-chemical principles that are necessary for the design, development, and preparation of pharmaceutical dosage forms. The study of quantitative skills necessary for an understanding of the basic and clinical pharmaceutical sciences, including skills in pharmaceutical calculations and extemporaneous preparation of dosage forms. lecture: three hours per week. Laboratory and Recitation: three hours per week. Requirement: P-1 standing or consent of the instructor. NOTE: [[PHA-311]] is a prerequisite for [[PHA-312]].

PHA-313. PHARMACY CALCULATIONS
Credits: 1

The common mathematical processes that a pharmacist may encounter in professional practice are covered. Interpretation of the prescription, including Latin abbreviations, will be discussed. Medical terminology and the generic name, trade name, manufacturer, and classification of the top 100 drugs will also be presented. Lecture one hour per week. Requirement: P-1 standing or permission of the instructor.

PHA-327. MEDICAL MICROBIOLOGY
Credits: 3

An overview of microbiology with special emphasis on pathogenic microbiology. Lecture: three hours per week. Requirement: P-1 standing or consent of the instructor. Cross listed with [[PHS 327]].

PHA-331. & 332. MEDICAL ANATOMY AND PHYSIOLOGY I & II
Credits: 4
Terms Offered: Fall,Spring

In-depth principles of human anatomy and physiology as well as an introduction to pathophysiology will be presented. Lecture: Two hours per week. Recitation and Lab: two hours per week. Requirement: P-1 standing or consent of the instructor. This course is restricted to enrolled Pharmacy students. Consideration may be given to non-pharmacy students with overall GPAs of 3.0 or greater, if there is room in the lecture and lab sessions, and with instructor approval. NOTE: PHA 331 is a prerequisite for PHA 332.

PHA-335. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE I
Credits: 2

This course will provide introductory practice experience to students in the community setting. The course fosters the development of professionalism in an environment of practical application of knowledge, skills, and attitudes. Students will be faced with a variety of issues practical to community pharmacy. The student will take an independent learning approach under the supervision of a practicing community pharmacist. The course is two full-time weeks (80 hours) of experience.

Pre-Requisites

Successful completion of all required courses in the P-1 year or permission of instructor.

PHA-360. SELF-DIRECTED IPPE I
Credits: 0.5

The Self-Directed (SD)-IPPE program is made up of three courses (SD-IPPE I, II, and III) over the span of the PI through P3 years. Collectively these courses consist of a total of 20 hours of pharmacy-related, service-oriented learning.

The Self-Directed Introductory Pharmacy Practice Experience (SD- IPPE) course is designed to expose students to various service-learning opportunities throughout their P 1 through P3 years. This experience consists of three components: participation in and development of service- learning projects, reflection, and self-directed learning. Students may develop their own experiences or participate in opportunities offered by the School or professional organizations.
Requirements for service learning hours will increase as the student progresses through the curriculum. Each student must complete a minimum of 2, 8, and 10 hours during the PI, P2, and P3 years, respectively (total 20 hours). Additional details are provided in the SDIPPE syllabus conveniently posted in E*Value.

Pre-Requisites

P1 standing for [[PHA-360]]
P2 standing and [[PHA-360]] for [[PHA-460]]
P3 standing and [[PHA-460]] for [[PHA-560]]

PHA-365. MEDICAL BIOCHEMISTRY
Credits: 4

Introduction to basic biochemistry concepts, focusing on the structure and function of vitamins, proteins, and lipids as well as bioenergetics and major catabolic pathways. The catabolism of carbohydrates, fats and amino acids will be discussed including reactions and regulation. Common metabolic pathways of drugs, enzyme induction and metabolism down regulation will also be presented. Lecture: Four hours per week. Cross-listed with [[CHM-365]], [[BEGR-465]].

Pre-Requisites

CHM-232 or CHM-235 with a grade of 2.0 or better or permission of the instructor

PHA-405. PHARMACEUTICAL CARE SYSTEMS: DESIGN AND CONTROL
Credits: 2

Examines delivery of pharmaceutical products and services from a systems perspective in a variety of patient care settings. Focus is upon effectiveness, efficiency, and quality. Covers design of systems, establishment and monitoring of key indicators, total quality management, and quality assurance agencies (e.g., JCAHO, NCQA). Lecture: two hours per week.

Pre-Requisites

P2 standing or instructor permission.

PHA-410. IMMUNOLOGY AND BIOTECHNOLOGY
Credits: 3

A discussion of nonspecific host defense mechanisms and a detailed description of specific immunity. Products that impart artificial active and passive immunity are presented. The concept of biotechnology is discussed together with the currently available products of genetic engineering that relate to immunology. The various immunological disorders and the immunology of cancer and HIV are discussed. Lecture: three hours per week.

Pre-Requisites

[[PHA-331]], [[PHA-332]], [[PHA-365]], or consent of the instructor.

PHA-411. BIOPHARMACEUTICS AND CLINICAL PHARMACOKINETICS
Credits: 3
Terms Offered: Fall

Biopharmaceutics and Clinical Pharmacokinetics is designed to educate pharmacy students in the principles of pharmacokinetics and biopharmaceutics and how they assist in dosage regimen design and therapeutic efficacy evaluations. The impact of the physical and chemical forms nature of the drug and dosage forms will be studied as they relate to the absorption, distribution, metabolism, and elimination. The clinical pharmacokinetics of individual drugs will be examined with emphasis on clinical application based on patient presentations. Case studies, homework, and quizzes will be used to facilitate student learning. This course is roughly divided into two parts. The first is Biopharmaceutics/ Pharmacokinetics and the second is Clinical Pharmacokinetics. Lecture: three hours per week.

Pre-Requisites

P2 standing, or consent of the instructor.

PHA-412. MANAGEMENT OF PHARMACY OPERATIONS
Credits: 3

The principles of management, including personnel and financial management, will be covered as they apply to management of pharmacy operations in a variety of settings (e.g., community, health system, managed care). Lecture: three hours per week.

Pre-Requisites

[[PHA-308]] or consent of the instructor.

PHA-421. PHARMACOTHERAPEUTICS I: PRINCIPLES OF PHARMACOLOGY & MEDICINAL CHEMISTRY
Credits: 2

This course is the 1st of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This particular course will emphasize the most fundamental concepts central to drug therapy. A major emphasis will be placed on the interactions of drugs with their cellular targets in the human body, and the chemical properties of drugs that dictate their biological activity.

Pre-Requisites

[[PHA-310]], [[PHA-327]], [[PHA-331]] [[PHA-332]] and [[PHA-365]]

Co-Requisites

[[PHA-423]], [[PHA-425]], [[PHA-401]]

PHA-423. PHARMACOTHERAPEUTICS II: PRINCIPLES OF PHARMACOTHERAPEUTICS
Credits: 2

This course is the 2nd of a twelve module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for understanding Pharmacotherapeutics principles.

Pre-Requisites

[[PHA-310]], [[PHA-327]], [[PHA-331]], [[PHA-332]], and [[PHA-365]] or [[CHM-365]]

Co-Requisites

[[PHA-421]], [[PHA-425]], and [[PHA-401]]

PHA-425. PHARMACOTHERAPEUTICS III: SELF-CARE AND DERMATOLOGY*
Credits: 3

This course is the 3rd of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of dermatological disorders and self- care issues.

Pre-Requisites

[[PHA-310]], [[PHA-327]], [[PHA-331]], [[PHA-332]], and [[PHA-365]] or [[CHM-365]], and [[PHA-421]]

Co-Requisites

[[PHA423]], [[PHA401]]

PHA-426. PHARMACOTHERAPEUTICS IV: GASTROINTESTINAL DISORDERS*
Credits: 2

This course is the 6th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of gastrointestinal diseases.

Pre-Requisites

[[PHA-421]] [[PHA-423]]

PHA-428. PHARMACOTHERAPEUTICS V: INFECTIOUS DISEASES*
Credits: 4

This course is the 4th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of infectious diseases.

Pre-Requisites

[[PHA-421]], [[PHA-423]]

PHA-430. PHARMACOTHERAPEUTICS VI: JOINT, AUTOIMMUNE AND MUSCULOSKELETAL DISORDERS
Credits: 2

This course is the 5th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of joint, autoimmune and musculoskeletal diseases.

Pre-Requisites

[[PHA-421]], [[PHA-423]]

PHA-435. PHARMACOGENOMICS
Credits: 2

Students will learn to understand how human genetics and genomics can be used to provide optimized drug therapy and patient care. Learning about this emerging field will enable students to better understand and manage new genomics-based diagnostic tools and make personalized treatment choices. Students will also spend time discussing societal and ethical implications of genetic testing and the resultant individualization of drug therapy, explain basic principles of human genetics and heredity, and more. Requirement: P-3 standing.

PHA-440. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE II
Credits: 1

This course will provide introductory practice experience to students in two health care settings: prescriber's clinics and a clinical pharmacy site. Students will have an independent approach to learning and gain a broader understanding of these settings and the role that pharmacists may play. Requirement: Successful completion of all required courses in the P-1 year, or permission of instructor.

PHA-445. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE III
Credits: 2

This course will provide introductory practice experience to students in the health-system setting. The course fosters the development of professionalism in an environment of practical application of knowledge, skills, and attitudes. Students will be faced with a variety of issues practical to this area of practice. The student will take an independent learning approach under the supervision of a practicing community pharmacist. The course is two full-time weeks (80 hours) of experience. Requirement: Successful completion of all required courses in P-2 year, or permission of instructor.

PHA-450. NEUROPHARMACOLOGY OF DRUGS OF ABUSE
Credits: 3
Terms Offered: Not Currently Offered

In-depth analysis of drugs of abuse, including pharmacokinetics, pharmacodynamics, tolerance, sensitization, physical dependence, and effects of drug use during pregnancy. Drug testing and substance abuse treatment strategies will also be discussed. Lecture: three hours.

Pre-Requisites

[[PHA-421]] or consent of the instructor.

PHA-452. EXTEMPORANEOUS COMPOUNDING
Credits: 3
Terms Offered: Not Currently Offered

Students will achieve basic and advanced skills in compounding pharmaceutical dosage forms for individualized patient therapy to replace a lack of commercially available products and enhance therapeutic problem-solving between the pharmacist and physician to enhance patient compliance. Students will work independently on research assignments and compounding preparations. Lecture: one hour per week. Lab: six hours per week.

Pre-Requisites

[[PHA-311]] and [[PHA-312]] and consent of the instructor.

PHA-456. CONCEPTS IN PRIMARY CARE
Credits: 2
Terms Offered: Not Currently Offered

The course is designed to allow students to explore and develop advanced knowledge and skills related to diseases and medications commonly encountered in a primary care environment. This course will be of value to pharmacy students seeking careers in ambulatory care pharmacy practice, community pharmacy, long-term care and population health management. Topics are presented in a case-based discussion format that includes multiple diseases and medications and through student-led mini topic discussions.

Pre-Requisites

P2 standing

PHA-460. SELF-DIRECTED IPPE II
Credits: 0.5

The Self-Directed (SD)-IPPE program is made up of three courses (SD-IPPE I, II, and III) over the span of the PI through P3 years. Collectively these courses consist of a total of 20 hours of pharmacy-related, service-oriented learning.

The Self-Directed Introductory Pharmacy Practice Experience (SD- IPPE) course is designed to expose students to various service-learning opportunities throughout their P 1 through P3 years. This experience consists of three components: participation in and development of service- learning projects, reflection, and self-directed learning. Students may develop their own experiences or participate in opportunities offered by the School or professional organizations.
Requirements for service learning hours will increase as the student progresses through the curriculum. Each student must complete a minimum of 2, 8, and 10 hours during the PI, P2, and P3 years, respectively (total 20 hours). Additional details are provided in the SDIPPE syllabus conveniently posted in E*Value.

Pre-Requisites

P1 standing for [[PHA-360]]
P2 standing and [[PHA-360]] for [[PHA-460]]
P3 standing and [[PHA-460]] for [[PHA-560]]

PHA-461. CANNABIS LAW AND POLICY
Credits: 1
Terms Offered: Fall

This course will cover the legal aspects of cannabis and hemp, including cultivation, dispensing, and therapeutic claims.

PHA-462. HEMP BIOLOGY AND ANALYSIS
Credits: 4

This course is an introduction to hemp biology and analysis. Topics include an overview of hemp, hemp phylogeny, subspecies, plant structure, development, reproduction, water uptake, transport, uses for hemp, hemp pathogens and pests, and ways to improve hemp production using biotechnology. Click here for course fee.

Pre-Requisites

Sophomore or pharmacy P-1 standing or instructor permission.

PHA-463. CANNABIS AND CANNABINOIDS
Credits: 3
Terms Offered: Fall

This course is an introduction to cannabis and cannabinoids. Topics include history, medicinal chemistry, pharmacokinetics, pharmacology and toxicology.

PHA-465. THERAPEUTICS OF MEDICINAL CANNABIS
Credits: 3
Terms Offered: Fall

Students will learn about therapeutic effects of cannabis, including its use in dependency, anorexia and cachexia in cancer patients, emesis, pain, migraines, muscle spasticity disorders, movement disorders, glaucoma, gynecology, dermatology, and the cardiovascular system. This course will also cover the risks and side effects, from a clinical perspective, of cannabis use during pregnancy, to the immune system, psyche and cognition, and the respiratory system.

Pre-Requisites

[[PHA 463]]

PHA-466. CANNABIS/CBD EXTRACTION CAPSTONE PROJECT SEMINAR
Credits: 3
Terms Offered: Spring,Not Currently Offered

This course will serve as a capstone for students who are enrolled in the Cannabis Certificate Program to engage in research and demonstrate competencies in Cannabis law, concentration, extraction and use of cannabis products. The students will be given the opportunity to collect data, initiate a lab experiment or analyze a potential use for cannabis, and determine the impact of the initiative on cannabis production, extraction, health care, local communities, global communities and cannabis use in the US.

Pre-Requisites

PHA 461, 462, 463, 464 and 465 (or suitable cross listed courses

PHA-488 . ASPECTS OF CARING FOR THE PAIN PATIENT
Credits: 2
Terms Offered: Fall

This course is an interactive and interprofessional approach to the assessment and management of pain. Various teaching and learning strategies will allow students to develop and appreciate the understanding of the social, psychological, physical, spiritual and ethical implications of pain.

Pre-Requisites

[[PHA-331]] and [[PHA-332]]

PHA-505. PHARMACY LAW
Credits: 2

The study of federal and state statutes, regulations, and court decisions, which control the practice of pharmacy and drug distribution. Civil liability in pharmacy practice and elements of business and contract law will be covered. Lecture: two hours per week (hybrid).

Pre-Requisites

P3 standing

PHA-506. CONCEPTS IN INFECTIOUS DISEASE
Credits: 2
Terms Offered: Fall

This course is offered to Fall semester to P3 students and is designed to allow students to explore and develop advanced knowledge and skills related to infectious diseases. This course will be of value to pharmacy students seeking careers in infectious diseases whether it be in ambulatory care pharmacy practice, community pharmacy, long-term care and population health management. Students will be heavily leading the course through presentations, cases and poster presentations. Active learning techniques are used throughout the course to build critical thinking and problem solving skills. Emphasis is placed on the integration of disease states and approaches to practice management. Assignments that engage students in lifelong learning and community engagement are additional features of the course.

Pre-Requisites

P3 standing

PHA-509. ECONOMIC EVALUATION OF PHARMACEUTICAL PRODUCTS AND SERVICES
Credits: 3

Introduction to commonly used economic evaluation methods (e.g., cost-minimization, cost-utility, cost-benefit, cost-effectiveness) as applied to pharmaceutical products and services. Quality of life and outcomes research will also be explored. Emphasis is on understanding evaluation methods and research design and interpreting the relevant literature for practice applications. Lecture: three hours per week.

Pre-Requisites

[[PHA-308]] and [[PHA-310]] or consent of the instructor.

PHA-510. GENERAL MEDICINE ADVANCED PHARMACY PRACTICE EXPERIENCE
Credits: 5-6

Integration of the basic pharmacy related concepts to the delivery of pharmaceutical care in general medicine practice. Clinical practice: 40 hours per week for five to six weeks.

Pre-Requisites

Successful completion P1-P3 curriculum in full.

PHA-511. AMBULATORY CARE ADVANCED PHARMACY PRACTICE EXPERIENCE
Credits: 5-6

Integration of the basic pharmacy related concepts to the delivery of pharmaceutical care in ambulatory care settings. Clinical practice: 40 hours per week for five to six weeks.

Pre-Requisites

Successful completion P1-P3 curriculum in full.

PHA-512. COMMUNITY ADVANCED PHARMACY PRACTICE EXPERIENCE
Credits: 5-6

Integration of the basic pharmacy related concepts to the delivery of pharmaceutical care in community practice settings. Clinical practice: 40 hours per week for five to six weeks.

Pre-Requisites

Successful completion P1-P3 curriculum in full.

PHA-513. HEALTH SYSTEM ADVANCED PHARMACY PRACTICE EXPERIENCE
Credits: 5-6

Integration of the basic pharmacy related concepts to the delivery of pharmaceutical care in the health system settings. Clinical practice: 40 hours per week for five to six weeks.

Pre-Requisites

Successful completion P1-P3 curriculum in full.

PHA-515. NAPLEX PREPARATION
Credits: 0

This course will be provided annually to P4 students to assist in preparation for The North American Pharmacist Licensure Examination (NAPLEX). Students will complete cumulative exams assigned by the coordinator.

Pre-Requisites

P4 standing.

PHA-521. PHARMACOTHERAPEUTICS VII: PULMONARY DISORDERS*
Credits: 2

This course is the 7th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of pulmonary diseases.

Pre-Requisites

[[PHA-421]], [[PHA-423]]

PHA-523. PHARMACOTHERAPEUTICS VIII: CARDIOVASCULAR DISORDERS*
Credits: 4

This course is the 8th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of cardiovascular diseases

Pre-Requisites

[[PHA-421]], [[PHA-423]]

PHA-525. PHARMACOTHERAPEUTICS IX: RENAL DISORDERS*
Credits: 2

This course is the 9th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of renal diseases.

Pre-Requisites

[[PHA-421]], [[PHA-423]]

PHA-526. PHARMACOTHERAPEUTICS X: ENDOCRINE DISORDERS & WOMEN'S/MEN'S HEALTH ISSUES*
Credits: 3

This course is the 10th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of endocrine diseases.

Pre-Requisites

[[PHA-421]], [[PHA-423]]

PHA-528. PHARMACOTHERAPEUTICS XI: HEMATOLOGY/ ONCOLOGY DISEASES*
Credits: 2

This course is the 12th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of gastrointestinal diseases.

Pre-Requisites

[[PHA-421]], [[PHA-423]]

PHA-530. PHARMACOTHERAPEUTICS XII: CENTRAL NERVOUS SYSTEM DISORDERS*
Credits: 3
Terms Offered: Spring
This course is the 11th of a twelve-module sequence that will integrate pharmacology, medicinal chemistry, pathophysiology and therapeutics. This team taught course is designed to provide students with an opportunity to learn, observe and apply concepts of these four content areas in an integrated manner. Concepts in each of these content areas will be emphasized to provide the necessary information for pharmaceutical management of CNS and mental health disorders.

Pre-Requisites
[[PHA-421]], [[PHA-423]]

PHA-532. INTEGRATIVE MEDICINE AND NUTRITION
Credits: 2
The purpose of the Integrative Medicine and Nutrition course is to help students learn to integrate nonconventional treatments (natural medicines, manipulation therapy, acupuncture, etc.) into traditional treatment strategies. Additionally, students will learn about nutrition support practices, including enteral and parenteral care.

Pre-Requisites
[[PHA-331]], [[PHA-332]], [[PHA-365]] or consent of the instructor.

PHA-534. INTRODUCTION TO HOSPITAL PHARMACY PRACTICE
Credits: 2
This course introduces students to the practice of pharmacy within a hospital setting. Topics discussed include the accreditation process for hospitals, career options and residency or fellowship training, medication formulary management, automation and technology in hospital pharmacies, medication calculations, medication safety, clinical pharmacy practice, and sterile product preparation.

PHA-536. PRINCIPLES OF ADVANCED COMMUNITY PHARMACY MANAGEMENT
Credits: 2
Terms Offered: Not Currently Offered
This course is designed to provide a foundation for students interested in pursuing the development and implementation of advanced clinical programs in a community pharmacy. The student will be introduced to principles in pharmacy and fiscal management, professional development, and the management and legal issues relating to clinical pharmacy services. Didactic and active learning techniques will be employed throughout the course and the student will be required to develop a business plan.

Pre-Requisites
P2 standing

PHA-538. PEDIATRIC PHARMACOTHERAPY
Credits: 2
Terms Offered: Not Currently Offered
This course is designed to expand the student's current knowledge base regarding the pediatric population and to introduce the core concepts involved in the care of this special population. The course prepares students to identify and address drug-related problems in pediatric patients and to demonstrate competency within those areas. This will be accomplished by completion of case scenarios, actual patient presentations, and a take-home examination. An on-site visit to the Children's Hospital of Philadelphia (CHOP) is required. Requirement: P-2 or P-3 standing.

Pre-Requisites
P2 or P3 standing

PHA-540. COMPREHENSIVE DIABETES MANAGEMENT
Credits: 3
This course provides a multidisciplinary foundation for health professionals in the principles of diabetes management. Students who successfully complete the course will have knowledge and the basic skill set that is needed to begin practicing diabetes management. The majority of this course is independent self-study of online lectures, but there are mandatory on-campus discussions and exams.Requirement: P2 or P-3 standing.

PHA-544. MANAGED CARE PHARMACY
Credits: 2
This elective is intended to help future pharmacists interested in any area of practice better understand the clinical and business decision-making processes of the health care system. The elective will introduce and reinforce the concepts of population health and value, explore tools available to limit healthcare spending, and discuss unique ways pharmacists can be involved in improving patient care. This course will be offered during the spring semester each year.

Pre-Requisites
P2 or P3 standing.

PHA-552. PRINCIPLES OF BIOORGANIC AND MEDICINAL CHEMISTRY
Credits: 3
Terms Offered: Spring
This will be an introductory course, the aims of which are to provide the principles of bioorganic and medical chemistry, including an understanding of drug structure-activity relationships, prediction of the physicochemical properties of a drug, basic knowledge of the major pathways of drug metabolism, and factors that can contribute to drug-drug interactions.

Pre-Requisites
[[CHM-231]] - [[CHM-232]] or [[CHM-235]] - [[CHM-237]]

PHA-555. INTRODUCTORY PHARMACY PRACTICE EXPERIENCE IV
Credits: 2
Terms Offered: Spring

The course is designed to provide an introductory practice experience at a P3 level in the areas of Medication Therapy Management (MTM)/clinical telepharmacy and Intergenerational (IG) patient care. The course fosters the development of knowledge, skills, and attitudes needed for pharmacy practice through practical application in telepharmacy patient care and community settings.

Pre-Requisites

Completion of all required courses in P2 year.

PHA-556. ROLE OF PHYTOCHEMICALS ON HEALTH AND DISEASE
Credits: 2

Students will learn the basic concepts and classification of phytochemicals present in our daily diet, followed by the study of specific phytochemicals and their relation to human health and disease. Basic mechanisms and pathways through which phytochemicals act and alter will be discussed. Students will have an opportunity to gain an in-depth understanding of a specific phytochemical of their choice or any other phytochemical designated by the instructor through a research review paper and an in-class presentation.

Pre-Requisites

P2 standing.

PHA-558. PRINCIPLES OF TOXICOLOGY: FROM BEAKER TO BEDSIDE
Credits: 2

This toxicology elective is designed to provide the student with introductory knowledge of the molecular mechanisms of action and clinical management of poisons. The course will begin with introductory concepts such as history, mechanisms of cell injury and toxicant disposition. The student will then be exposed to the fundamental principles of managing an acutely poisoned patient. Toxicology lectures on each major organ system will prepare students for group presentations. The aims of student presentations will be to achieve a greater understanding of the clinical management of the poisoned patient, and to hone presentation skills. To the extent that is feasible, the course will involve lectures, or other learning experiences, led by external specialists.
The scope of poisons that will be discussed is broad, and includes environmental toxins, industrial toxicants, and drugs. Specific agents will include heavy metals, volatile solvents, common plant toxins, rodenticides, and several drugs. Students may be expected to participate in one laboratory exercise, wherein they will learn a fundamental method to characterize the mechanism and/or extent of cell death induced by a toxicant.

Pre-Requisites

P-2 or P-3 standing or permission of the instructor

PHA-560. SELF-DIRECTED IPPE III
Credits: 0.5

The Self-Directed (SD)-IPPE program is made up of three courses (SD-IPPE I, II, and III) over the span of the PI through P3 years. Collectively these courses consist of a total of 20 hours of pharmacy-related, service-oriented learning.

The Self-Directed Introductory Pharmacy Practice Experience (SD- IPPE) course is designed to expose students to various service-learning opportunities throughout their P 1 through P3 years. This experience consists of three components: participation in and development of service- learning projects, reflection, and self-directed learning. Students may develop their own experiences or participate in opportunities offered by the School or professional organizations.
Requirements for service learning hours will increase as the student progresses through the curriculum. Each student must complete a minimum of 2, 8, and 10 hours during the PI, P2, and P3 years, respectively (total 20 hours). Additional details are provided in the SDIPPE syllabus conveniently posted in E*Value.

Pre-Requisites

P1 standing for [[PHA-360]]
P2 standing and [[PHA-360]] for [[PHA-460]]
P3 standing and [[PHA-460]] for [[PHA-560]]

PHA-561. PRINCIPLES OF ENVIRONMENTAL HEALTH FOR PUBLIC HEALTH PRACTICE
Credits: 3

Environmental health is concerned with the mechanisms by which the natural and created environment impact public health. The altered physical, chemical and biological systems will be presented from the perspectives of the population and community health. The course will focus on disease prevention, assessment and mitigation of environmental challenges to public health.

Pre-Requisites

[[PHA 564]] Crosslisted with [[PHA 310]] or permission of instructor

PHA-562. SOCIAL AND BEHAVIORAL ASPECTS OF PUBLIC HEALTH
Credits: 3

Learners will develop public health competency in social concepts and processes that influence health status and public health interventions using the ecological approach. Targeted examination of population and individuals behaviors which influence health will utilize a range of methods necessary for behavioral change.

Pre-Requisites

[[PHA 564]] Cross-listed with [[PHA 310]] or permission of instructor

PHA-563. PUBLIC HEALTH AND PHARMACY
Credits: 3

This course will introduce students to the role pharmacists play in public health. Content will discuss the history of pharmacy and how public health was introduced into the field of pharmacy. The role of public health as it relates to the work of the pharmacy by providing education on policy, patient education and population management will also be included.

Pre-Requisites

[[PHA 564]] Cross-listed with [[PHA 310]] or permission of instructor

PHA-564. CLINICAL RESEARCH AND DESIGN
Credits: 3

This course focuses on the application of research design concepts and statistical techniques to design critically analyze and interpret multiple study designs. Understanding and practicing research methods are essential for pharmacists for two reasons. First, as a consumer of research, you will need to read and critically analyze published research. As a member of a health care team, you will need to maintain current awareness of the existing literature and its relevance to the case at hand. Second, as a provider of research, you will need the ability to validate your practice through scientific investigation (e.g. in the current healthcare arena it is expected that health care providers justify, through research, more of their practice).

Pre-Requisites

P1 standing or instructor permission

PHA-599. A, B AND C ELECTIVE ADVANCED PHARMACY PRACTICE EXPERIENCE ROTATIONS
Credits: 5-6

Advanced pharmacy practice experience involved in different aspects of pharmaceutical care. (Courses to be determined.) Clinical practice: 40 hours per week for a total of five weeks.

Pre-Requisites

Successful completion P1-P3 curriculum in full.

PPD. PERSONAL AND PROFESSIONAL DEVELOPMENT

PPD-101. PERSONAL AND PROFESSIONAL DEVELOPMENT I
Credits: 1

The PPD Series begins with Personal and Professional Development 101, which adds value and depth to your learning program by explicitly targeting personal and professional competency assessment, development, practice and evaluation with a strong emphasis on self-awareness, working in teams, and an introduction to emotional intelligence competencies.

PPD-201. PERSONAL AND PROFESSIONAL DEVELOPMENT II
Credits: 1

One credit Special studies and experiences in career focused areas of personal and professional development. The one-credit courses vary each semester and are taught by subject matter experts.

PPD-301. PERSONAL AND PROFESSIONAL DEVELOPMENT III
Credits: 1

One credit special studies and experiences in leadership focused areas of personal and professional development. The topics will be relevant to leadership issues, leadership skills, showcasing leadership through the creation of an electronic portfolio, presentation of the electronic portfolio to outside business professionals, and receiving evaluation on work. The one-credit courses vary each semester and are taught by subject matter experts

PPD-401. PERSONAL AND PROFESSIONAL DEVELOPMENT IV
Credits: 1

The PPD Series adds value and depth to your learning program by targeting personal and professional competency assessment, development, practice, and evaluation. [[PPD-401]] continues the Life Plan and prepares students for development of a Professional Learning Plan. Emphasis will be on continuous portfolio and résumé development, interview skills, and job search strategies, and exposure to recruiters and businesses.

Pre-Requisites

[[PPD-101]], [[PPD-201]], & [[PPD-301]]

PHL. PHILOSOPHY

PHL-101. INTRODUCTION TO PHILOSOPHY
Credits: 3

An introduction to some of the major figures, problems, and concerns of philosophical thought. Students in this course typically examine a variety of philosophical questions and problems such as the existence of God, human nature and the good life, freedom and responsibility, skepticism and the nature of knowledge, and theories of reality.

PHL-110. INTRODUCTION TO ETHICAL PROBLEMS
Credits: 3

An exploration of a series of basic ethical problems. Topics to be covered include basic ethical theories, how to evaluate ethical theories and moral arguments, the relationship between religion and ethics, and a selection of current moral problems such as abortion, capital punishment, affirmative action, animal rights, etc. Specific moral problems covered will vary. Other ethical questions such as 'How should we live?' may also be covered in the course.

PHL-114. INTRODUCTION TO BIOETHICS
Credits: 3

This course serves as an introduction to bioethics. Basic ethical theories and concepts and their application to issues biomedicine and health care will be discussed. Topics to be covered may include: euthanasia, assisted suicide, experimentation with human and animal subjects, health care resource allocation and neuroethics.

PHL-115. BUSINESS ETHICS
Credits: 3

This course serves as an introduction to business ethics. Basic ethical theories and concepts and their application to issues in business will be discussed. Topics to be covered may include: corporate social responsibility, fairness and economic justice, the moral justification of capitalism, environmental values and justice, consumerism and the ethics of advertising, moral hazard and conflicts of interest, and moral psychology as it relates to organizational contexts.

PHL-198. TOPICS
Credits: 3

The study of a topic of special interest not extensively treated in other courses. Topics chosen according to interest of the instructor. Because of its variable content, this course may be repeated for credit.

Pre-Requisites

Completion of any Philosophy course numbered 120 or lower, or permission of instructor.

PHL-203. INTRODUCTION TO SYMBOLIC LOGIC
Credits: 3

An introduction to the nature of logical systems and deductive reasoning. The study of the syntax and semantics of formal languages; testing arguments for validity; and an examination of other important logical notions, such as proof and consistency.

PHL-216. VIOLENCE AND NONVIOLENCE
Credits: 3

An examination of the concepts and practices of violence and nonviolence. Historical and modern theories and applications will be explored including questions such as why and how nonviolence has been advocated, how civil defense might be structured without violence, whether nuclear weapon use can be justified, and whether torture is ever morally permissible. Students will be expected to consider the importance and relevance of the ideas for their own lives.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-217. ANIMAL MINDS, ANIMAL LIVES
Credits: 3

An exploration of the philosophical questions that arise from considering the ways in which nonhuman animals are similar to and different from humans. Questions from ethics, epistemology, philosophy of mind, feminist philosophy, and political philosophy will be taken up. Scientific evidence and the history of our attitudes toward nonhuman animals will be investigated in the process.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-218. ENVIRONMENTAL ETHICS
Credits: 3

An examination of the central problems of environmental ethics as viewed from the perspectives of science and of philosophy. The value of nature and 'natural objects,' differing attitudes toward wildlife and the land itself, implications of anthropocentrism, individualism, ecocentrism, and ecofeminism, bases for land and water conservation, and other topics will be examined within a framework of moral and scientific argument. (Cross-listed with [[EES-218]].)

Pre-Requisites

Any 100-level PHL course, [EES-240]], or permission of the instructor.

PHL-236. AMERICAN POLITICAL PHILOSOPHY
Credits: 3

The study of the political ideas, ideals, and ideologies that contributed to and developed from the American experience. An analysis of the ideas that underlie America’s political institutions and practices. Cross listed with [[PS-262]].

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-242. THE MEANING OF LIFE
Credits: 3

A selection of culturally diverse classic and contemporary answers to the question of the meaning of life will be examined and the implications of our lives will be explored. Perspectives to be addressed include those of Epicurus, Epictetus, Aristotle, Lao-Tzu, the Buddha, Viktor Frankl, Albert Camus, A.J. Ayer, Peter Singer, and more.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-244. BUDDHIST THOUGHT
Credits: 3

An exploration and examination of basic ideas in Buddhist philosophy, considering all three main 'vehicles' of Buddhist thought—Theravada, Mahayana, and Vajrayana schools. Comparisons to Western philosophical thought will be made and some Buddhist practices explored.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-246. HAPPINESS AND THE GOOD LIFE
Credits: 3

A philosophical exploration of “the good life,” a life of human flourishing, looking both at what constitutes such a life and how one might achieve it. We will examine classical and modern ideas on what both the good life and happiness consist of as well as how to achieve them using the work of philosophers, historians, psychologists, poets and more.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-260. INTRODUCTION TO POLITICAL PHILOSOPHY
Credits: 3

An introduction to central questions in political philosophy, focusing on topics like human nature and political organization, the justification of the state, democratic government and its critics, the importance of individual liberty, property and the free market, conceptions of fairness, and the ideal of justice. Cross-listed with [[PS-260]].

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-272. PHILOSOPHY OF RELIGION
Credits: 3

An examination of various problems that arise when religion is made the object of philosophical reflection: the nature and forms of religious experience; the relationship between faith and reason; arguments for the existence of God; the problem of evil; arguments for immortality; the concepts of worship and miracle; the nature of religious language; and the possibility of religious knowledge.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-298. TOPICS
Credits: 3

The study of a topic of special interest not extensively treated in other courses. Topics chosen according to interest of the instructor. Because of its variable content, this course may be repeated for credit.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-301. ORIGINS OF WESTERN THOUGHT
Credits: 3

The development of Western philosophical thought from its beginnings in the Greek world to early Christian thought. Philosophers to be studied include the Pre-socratics, Plato, Aristotle, Plotinus, the Stoics, Epicurus, Sextus Empiricus, and St. Augustine.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-310. ETHICAL THEORY
Credits: 3

A study of classical and contemporary ethical theories, the problems that they raise and the problems they are intended to solve. The theories of Plato, Aristotle, Kant, Hume, and Mill will be examined as well as recent contributions by Ross, Harman, Moore, Ayer, Stevenson, and Hare. Questions addressing ethical relativism, the relationship of religion to ethics, skepticism, moral realism, egoism, and value judgments will also be discussed.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-312. VIRTUES AND VICES IN LIFE AND LITERATURE
Credits: 3

A philosophical exploration of human excellences and failings using a variety of philosophical works as well as novels and a psychological study of people who rescued Jews during the Holocaust. Issues of gender, race, class, immigration status, religion and more are addressed.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-314. ADVANCED TOPICS IN BIOETHICS
Credits: 3

An in-depth exploration of the ideas of a selection of philosophers known for their often radical contributions in the field of bioethics. Topics include the appropriate and inappropriate use of moral principles and theories, public policies to change or maintain in the area of bioethics, and whether our attitudes toward personhood and life and death are defensible.

Pre-Requisites

[[PHL-214]] or permission of instructor.

PHL-316. MORAL PSYCHOLOGY
Credits: 3

An analysis of some current questions in moral psychology, an area of philosophy that addresses normative issues regarding human psychology including motives, emotions, psychological reactions, etc. Questions to be addressed include questions about moral luck (whether it is possible for an agent to be caught in a situation, through no fault of her own, in which it is impossible to act rightly), about whether one's moral character may be subject to luck in important ways, about whether there are reasons to act morally if one does not care about reputation or morality, and questions about when judgments of responsibility for actions and character are appropriate.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-334. PHILOSOPHY OF LAW
Credits: 3

This course serves as an introduction to the central topics in the Philosophy of Law, including the nature and justification of the law, the relation between law and morality, the principles of legal interpretation, and the justification and limits of criminal sanctions. The work of both classical and contemporary legal and political theorists will be explored, as well as a selection of legal cases that have shaped American law, including recent cases, and an investigation of some implications for legal cases arising from new developments in neuroscience. .

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-344. ADVANCED TOPICS IN BUDDHIST THOUGHT
Credits: 3

An examination of the history of Buddhist philosophy and the issues it raises with particular emphasis on *shunyata*.

Pre-Requisites

[[PHL-244]] or permission of instructor.

PHL-350. PHILOSOPHY OF SCIENCE
Credits: 3

A critical examination of various issues concerning scientific thought. Topics may include the nature of science, distinguishing science from pseudo-science, the nature of theories, scientific explanation, space and time, causality, the problem of induction, laws of nature, and the reality of theoretical entities.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-372. ADVANCED TOPICS IN PHILOSOPHY OF RELIGION
Credits: 3

Pre-Requisites

[[PHL-272]] or permission of instructor.

PHL-390. SENIOR PROJECTS: CAPSTONE
Credits: 1

An independent project culminating in a formal essay and presentation. The project serves as a capstone experience demonstrating the student's learning in the major. Open only to senior Philosophy majors.

PHL-397. SEMINAR
Credits: 1-3

Presentations and discussions of selected topics.

Pre-Requisites

Approval of course instructor is required.

PHL-398. TOPICS
Credits: 3

The study of a topic of special interest not extensively treated in other courses. Topics chosen according to interest of the instructor. Because of its variable content, this course may be repeated for credit.

Pre-Requisites

Any 100-level PHL course or permission of the instructor.

PHL-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See the Cooperative Education section of this bulletin for placement procedures.)

Pre-Requisites

Sophomore standing, 2.0 cumulative GPA, consent of academic advisor, and approval of placement by the department chairperson.

PHY. PHYSICS

PHY-198-298-398. TOPICS IN PHYSICS
Credits: variable

Selected topics in the field of physics. These may include one or more of the following: astronomy; geophysics; biophysics; nuclear power and waste; relativity; quantum mechanics; semi-conductors; cryogenics; health physics. May be repeated for credit.

Pre-Requisites

Varies with topic studied.

PHY-395-396. INDEPENDENT RESEARCH
Credits: 1 - 3

Independent study and research for advanced students in the field of physics under the direction of a staff member. A research paper at a level significantly beyond a term paper is required.

Pre-Requisites

Senior standing and approval of the department chairperson.

PHY-105. CONCEPTS IN PHYSICS
Credits: 3

Basic concepts of physical science, including the scientific method, will be studied. Theories, laws, and experiments from mechanics, electricity and magnetism, thermodynamics, optics, and atomic and nuclear physics may be included. Viewpoints will be classical and modern, including quantum and relativistic. Class meets for four hours per week: two hours of lecture and one two-hour lab each week.
Click here for course fees.

Pre-Requisites

No previous background in either science or college-level mathematics is required.

PHY-140. SCIENTIFIC PROGRAMMING
Credits: 3

This course presents an introduction to computer programming with an emphasis on the techniques needed for data analysis and numerical problem solving for scientific and engineering applications. Basic programming idioms are presented including control structures, data types, methods for handling input and output as well as numerical methods such as array computing and vectorization. Emphasis is placed on proper software engineering practice as well as data analysis and presentation. Two hours of lecture and two hours of laboratory per week.

Pre-Requisites

Or Concurrent
[[MTH-100]] or [[MTH-111]]

PHY-171. PRINCIPLES OF CLASSICAL AND MODERN PHYSICS
Credits: 4

An introductory course designed to promote and understanding of the more important fundamental laws and methods of mechanics and electricity and magnetism. Laboratory work to emphasize basic principles and to acquaint the student with measuring instruments and their use, as well as the interpretation of experimental data. Three hours of demonstration and lecture, one hour of recitation, and two hours of lab per week. Co-requisite: [[MTH-111]]
Click here for course fees.

PHY-174. APPLICATION OF CLASSICAL AND MODERN PHYSICS
Credits: 4

An introductory course designed to promote an understanding of the more important fundamental laws and methods of heat, optics, and modern physics. Laboratory work to emphasize basic principles and to acquaint the student with measuring instruments and their use, as well as the interpretation of experimental data. Three hours of demonstration and lecture, one hour of recitation, and two hours of lab per week. Co-requisite: [[MTH-111]]
Click here for course fees.

PHY-201. GENERAL PHYSICS I
Credits: 3

A thorough grounding in the concepts, principles, and laws of mechanics, and wave motion. Instruction by demonstration and lecture, recitation, and problem solving. Four hours of demonstration and lecture per week.

Click here for course fee.

Co-Requisites

[[MTH-111]] and [[PHY-204]]

PHY-202. GENERAL PHYSICS II
Credits: 3

A thorough grounding in the concepts, principles, and laws of Electricity and magnetism, optics and light. Instruction by demonstration and lecture, recitation, and problem solving. Four hours of demonstration and lecture per week.

Click here for course fee.

Pre-Requisites

[[PHY-201]]

Co-Requisites

[[MTH-112]]
[[PHY-205]]

PHY-203. MODERN PHYSICS
Credits: 3

Modern physics including the experimental basis, concepts, and principles of atomic and nuclear physics. Three hours of demonstration and lecture per week.

Pre-Requisites

[[PHY-202]].

PHY-204. GENERAL PHYSICS I LAB
Credits: 1
Fees: $100

This is a one-semester introductory physics laboratory course for science and engineering students. Experiments are performed to reinforce the concepts learned in PHY 201. Includes one two-hour laboratory exercise per week.
Click here for course fee.

Co-Requisites

[[PHY-201]]

PHY-205. GENERAL PHYSICS II LAB
Credits: 1
Fees: $100

This is a one-semester introductory physics laboratory course for science and engineering students. Experiments are performed to reinforce the concepts learned in PHY 202. Includes one two-hour laboratory exercise per week.
Click here for course fee.

Pre-Requisites

[[PHY-204]]

Co-Requisites

[[PHY-202]]

PHY-206. MODERN PHYSICS LAB
Credits: 1
Fees: $150

This intermediate level laboratory course offers a modern view of some of the famous experiments in the history of physics leading to the development of relativity and quantum theory. Additionally, the experiments are designed to prepare students to conduct experiments in contemporary physics labs. In doing so, this course presents a hands-on experience to reinforce the learning of fundamental concepts in EM theory, relativity, statistical mechanics, quantum mechanics, solid state physics, atomic physics, and nuclear physics.

Click here for course fee.

Pre-Requisites

[[PHY-201]] and [[PHY-202]]

Co-Requisites

[[PHY-203]]

PHY-214. APPLIED PHYSICS
Credits: 3

Modeling of various problems in physical, chemical, biological, and environmental sciences, particularly physical dynamical systems; Includes application of ordinary differential equations, and Laplace, Fourier, and Z transforms to continuous and discrete processes, matrix mechanics and eigenvalue problems, statistics and probability, random processes and distribution functions.
2 hours of lecture and 2 hours of laboratory per week.

Click here for course fee.

Pre-Requisites

[[MTH-211]]

PHY-311. THERMODYNAMICS & STATISTICAL MECHANICS
Credits: 3

This course focuses on the laws of thermodynamics and other thermodynamic concepts including entropy, free energy, equilibrium, and fluctuations as well as their pivotal role in physics and other scientific disciplines. Topics in statistical mechanics will be covered including partition functions, ensembles, kinetic theory, and phase transitions. Three hours of lecture per week.

Pre-Requisites

[[PHY-203]] and [[MTH-211]].

PHY-312. ANALYTICAL MECHANICS
Credits: 3

Employs advanced mathematical tools to study applications in complex mechanical systems. It offers an advanced differential reformulation of Newton's laws to study dynamical systems in multiple dimensions, conservative force fields, damped and driven oscillations, two-body problem, central forces and planetary motion, and the rotational dynamics of rigid bodies. Additionally, the course delivers a thorough grounding on the calculus of variations, Lagrange's formalism and Hamiltonian mechanics, all being the essential foundations for the development of modern physics (relativity, quantum mechanics, and quantum field theory). Three hours of lecture per week.

Pre-Requisites

[[PHY-202]] and [[MTH-211]].

PHY-314. QUANTUM MECHANICS
Credits: 3

This course presents an intermediate level of Quantum Mechanics using the abstract formulation of linear vector spaces in the Dirac formalism. Topics covered include: spin, addition of angular momentum, scattering and bound particles, the harmonic oscillator, two-body problem and central potential wells in 3D, H-atom and H-like atoms, time-independent perturbation theory, identical particles and the He-atom. In addition to the foundations of Quantum Mechanics, the course offers a selection of advanced and modern topics like entanglement and quantum teleportation. Three hours of lecture per week.

Pre-Requisites

[[PHY-203]], [[CHM-115]], [[MTH-211]], and [[MTH-212]].

PHY-374. IMAGING IN BIOMEDICINE
Credits: 3

This course will cover different aspects of imaging important to medicine and biomedicine including optical microscopy, scanning probe microscopy, scanning electron microscopy, magnetic resonance, ultrasound X-ray, nuclear radiation, microwave and electro-/magneto-encephalographic techniques as well as image processing. Three hours of lecture and three hours of lab per week.
Click here for course fee.

Pre-Requisites

[[PHY-201]] & [[PHY-202]] or [[PHY-171]] & [[PHY-174]], [[MTH-112]].

PHY-377. BIOPHYSICS
Credits: 3

This course presents an overview of the important physical principles governing the behavior of cells and macromolecules. Upper-level mathematics that are useful to understand these phenomena are introduced in a way that is comprehensible to biology majors lacking background beyond basic calculus. In addition to the physical models governing the most ubiquitous molecular and cellular processes, the physics behind the most common experimental techniques used in biology, bioengineering, and biophysics are covered. Three hours of lecture and two hours of lab per week.

Pre-Requisites

[[PHY-201]] & [[PHY-202]] or [[PHY-171]] & [[PHY-174]], [[MTH-112]].

PHY-391. SENIOR PROJECT I
Credits: 1

Students will plan and execute a research project in the field of physics or at the intersection of physics and another related discipline. Projects can be theoretical, experimental or both and can include the design of unique experiments and simulations. A detailed progress report and presentation are required. Students pursuing a dual degree or double major may be eligible to combine this project with the capstone project of another program (subject to the approval of their advisors in both programs).
Click here for course fee.

Pre-Requisites

Senior standing in Physics

PHY-392. SENIOR PROJECT II
Credits: 2

Students will plan and execute a research project in the field of physics or at the intersection of physics and another related discipline. This is a continuation of PHY 391. A professional paper and progress report are required. Students will present the results of their work in an open-forum. Students pursuing a dual degree or double major may be eligible to combine this project with the capstone project of another program (subject to the approval of their advisors in both programs).
Click here for course fee.

Pre-Requisites

[[PHY-391]]

PS. POLITICAL SCIENCE

PS-111. INTRODUCTION TO AMERICAN GOVERNMENT
Credits: 3

How and why does the American federal system work? This course introduces students to the constitutional foundations of the American governmental system and explains how and why the system changed over time to function as it does today. Many examples are employed to illustrate the challenges facing those who occupy elected office and the voters who placed them in office. Students are also introduced to basic social science research methods and how they are applied to the study of American politics. Offered every semester.

PS-141. INTRODUCTION TO INTERNATIONAL RELATIONS
Credits: 3

An introduction to the field of international relations. Attention is given to basic theories of international relations as well as the issues and problems that confront contemporary world politics. Factors that determine a nation's foreign policy are also examined. Offered every spring.

PS-151. INTRODUCTION TO COMPARATIVE POLITICS
Credits: 3

This course is an introduction to the study of the politics and government of selected foreign countries. The course will begin with the examination of the various structures and concepts of government around the world and their regional variations. Progressing from the study of a number of alternative structures of politics and government, the course examines several countries in detail providing a specific introduction to the political structures of a number of countries.

PS-212. URBAN GOVERNMENT AND POLITICS
Credits: 3

An examination of the structure and operation of urban governments. Metropolitan politics is also considered. Special attention is given to the politics and policy problems confronting American cities and the political dynamics that complicate solving the problems. Cross listed with [[SOC-263]]. Counts as a Criminology elective.

PS-213. PARTIES AND ELECTIONS
Credits: 3

Though America's Founding Fathers may have had no love for or willingness to incorporate political parties into the Constitution of 1787, parties emerged anyway over the next twenty years. This course explores the origins and developments of political parties and their essential role in our democratic, representative political system. The ideas on which the parties were founded are examined and the evolution to their current positions is analyzed. Many examples of parties and elections at the federal, state and local levels of government are used. Offered every fall semester even years.

PS-221. INTRODUCTION TO PUBLIC ADMINISTRATION
Credits: 3

An introduction to the principles and problems of public administration in an increasingly complex society. Topic such as leadership, informal organizational processes, the relationship of administration to its cultural context, and the question of administrative responsibilities are examined as well as public finance, human resources, ethics, management and administrative law.

PS-224. PUBLIC POLICY ANALYSIS
Credits: 3

This course is an introduction to the study of public policy at the national level. It examines approaches to public policy and the operation of the 'policy process.' A range of public policy examples is employed, from social welfare to energy and environment to foreign and defense issues.

PS-226. ENVIRONMENTAL POLICY

PS-232. CRIMINAL LAW
Credits: 3

An introduction to the study of criminal law. The principles of criminal law are presented using the case method. The structure and operation of the criminal justice system are also reviewed. Offered every fall.

Pre-Requisites

[[PS-111]].

PS-233. LAW AND SOCIETY
Credits: 3

An introduction to the study of law and its role in social and political systems. Attention is given to theories of law and to the structure of the legal system. Students are given the opportunity to engage in hypothetical dispute resolutions using common law methods. Offered every spring.

Pre-Requisites

[[PS-111]].

PS-242. INTERNATIONAL LAW AND ORGANIZATION
Credits: 3

The study of the nature, application, and sources of international law and how it relates to the evolution of global and regional organizations and alliances, including international non-governmental organizations and other non-state factors.

Pre-Requisites

[[PS-141]] or consent of instructor.

PS-251. EUROPEAN POLITICS
Credits: 3

Comparison of the development, institutions, problems and prospects of democratic systems is Europe, both west and east. Attention is given to the European Community and its role in the transformation of Europe as well as the development of the former communist states in eastern Europe.

PS-252. THE CHANGING FACE OF EASTERN EUROPE
Credits: 3

This course examines the theoretical and empirical problems related to the process of transition to democracy in Central and Eastern Europe. Topics such as privatization, human rights, transitional justice, security dilemmas and institutional deadlocked are addressed in this course.

PS-255. POLITICAL ECONOMY OF COFFEE
Credits: 3

This course examines the political economic aspects of the production of coffee, principally in Central America. After an examination of the current state of coffee production in the world, this course studies the historic role of coffee in Central America and how it has affected the politics, history, and people of the region.

PS-260. INTRODUCTION TO POLITICAL THINKING
Credits: 3

An introduction to the study of politics through an examination of the crucial issues with which political scientists grapple: justice, equality, freedom, power, and the good life, to name a few. Offered every spring. Cross-listed with [[PHL-260]].

PS-261. RESEARCH METHODS IN POLITICAL SCIENCE
Credits: 3

A survey of the major concepts, theories and methods of political science as a discipline. Preparation of a research design and a review of quantitative methods also included. Offered every fall.

PS-262. AMERICAN POLITICAL THOUGHT
Credits: 3

The study of the political ideas, ideals, and ideologies that contributed to and developed from the American experience. An analysis of the ideas that underlie America's political institutions and practices. Cross listed with [[PHL-236]]. May not be used to meet Area I requirements of the General Education Curriculum.

PS-265. QUANTITATIVE REASONING FOR THE SOCIAL SCIENCES
Credits: 3

This course is an introduction to quantitative analysis for the social sciences using SPSS, one of the most frequently and widely used statistical packages in the world. Students will learn how to enter and manipulate data in SPSS, apply and interpret statistics from descriptive through multiple regression, and test hypotheses using statistical methods. Cross listed with [[SOC-370]].

Pre-Requisites

[[PS-111]] or 141, [[PS-261]] or [[SOC-371]], or approval of instructor.

PS-309. CAREER MENTORING FOR THE SOCIAL SCIENCES
Credits: 2

This course will offer career guidance for students in the Behavioral and Social Sciences. The course will include topics such as mentoring, networking, résumés and interviewing skills. Course credits will not count towards minor credits. Open only to majors in the social and behavioral sciences.

Pre-Requisites

[[PS-111]], junior standing. Course will be cross-listed with PSY and [[SOC-309]]

PS-311. THE AMERICAN PRESIDENCY
Credits: 3

An exploration and analysis of the development of the American President as political leader, chief executive, and world leader as well as the origins and growth of the institutional presidency. Special attention is given to the selection process and its effect on the Presidency. Offered in the fall semester in odd years.

Pre-Requisites

[[PS-111]] or consent of the instructor.

PS-312. THE US CONGRESS
Credits: 3

Congress is often referred to as "the People's Branch" of government because voters now directly elect members of both houses, which is different than the other two branches. Yet Congress regularly is held in low esteem by the public. This course explores the constitutional basis of Congress: how it is elected, its powers and its role in a system of separate branches with checks and balances. It also traces Congress's historical development and explains how and why it functions today. Multiple case studies are used to illustrate important points, and a congressional simulation is conducted at the semester's end in which students assume the role of a newly elected member of the House. Offered every spring semester in even years.

Pre-Requisites

[[PS-111]] or consent of the instructor.

PS-331. THE CONSTITUTION AND THE FEDERAL SYSTEM
Credits: 3

The study of the meaning of the Constitution as interpreted by the Supreme Court. Analysis of the powers of the three branches of government and of the relations between the states and the federal government. Offered in the spring semester in even years.

Pre-Requisites

[[PS-111]], [[PS-233]], or consent of the instructor.

PS-332. CIVIL RIGHTS AND LIBERTIES
Credits: 3

The study of the growth and change of the American Constitution through analyses of the landmark decisions regarding free speech and press, separation of church and state, rights of persons accused of crimes, equal protection of the laws, voting rights. Offered in the fall semester in even years.

Pre-Requisites

[[PS-111]], [[PS-233]], or consent of the instructor.

PS-341. MODEL UNITED NATIONS
Credits: 3

This course is a comprehensive examination of the role of the United Nations in the world, culminating in the Model United Nations conference in New York. The course will prepare students to participate in the conference by teaching them the structures and functions of the UN as well as the history and viewpoints of the assigned country.

PS-345. AMERICAN NATIONAL SECURITY POLICY
Credits: 3

This course analyzes U.S. National Security Policy, the combination of foreign and defense policies. Using theories of international politics and foreign policy, students learn about the evolution of U.S. national security from the War of Independence to the contemporary period. Theoretical approaches, such as geopolitics, balance of power, and force doctrines, are examined. The agencies and personnel that develop and implement security policy are also studied.

Pre-Requisites

[[PS-141]] or permission of the instructor.

PS-350. COMPARATIVE POLITICS: THEORY AND ANALYSIS
Credits: 3

This course is an introduction to the study of politics and governments from a comparative perspective. It is not a survey course of the governmental institutions of particular countries, but rather an examination of types of governments and regimes, the transitions that may occur between types of government, and approaches to studying these topics. The course examines the ways that ethnicity and cultural ideas affect governments and regime transition.

Pre-Requisites

Sophomore standing.

PS-354. ECOTOURISM DEVELOPMENT IN COSTA RICA
Credits: 3

As an international service-learning course, this class will work with a selected community in Costa Rica on their ecotourism development plan. Students will assist this community with a variety of tasks including an ecotourism business plan, sustainability projects and other tasks determined by our community partner. The course will begin with an examination of the public policy and economic aspects of the development of ecotourism in Costa Rica and how it can benefit our community partner. The second portion of the course will provide an intensive in-country experience with ecotourism stakeholders from both the public and private sector. Students will design and implement a number of projects in Costa Rica to assist the community in the development of its ecotourism industry. The final segment of the course will examine the effects of the service projects completed in Costa Rica on campus.

PS-380. POLITICAL SCIENCE SENIOR PROJECT
Credits: 3

This course is the capstone experience for Political Science majors. During the semester, the student completes the research project begun during [[PS-261]] (that is, data and information are gathered and analyzed), and the results written in a formal paper. Students present their findings in a public forum where the department’s faculty and students are present. Offered every semester.

Pre-Requisites

Senior standing, [[PS-261]] and [[PS-265]]

PS-394. PRACTICUM
Credits: 1-3

Pre-Requisites

No course prerequisites, but the permission of the instructor or faculty member is required in advance.

PS-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See the Cooperative Education section of this bulletin for placement procedures.)

Pre-Requisites

Sophomore standing, minimum 2.0 cumulative GPA, consent of academic advisor, and approval of placement by the department chairperson.

PSY. PSYCHOLOGY

PSY-101. GENERAL PSYCHOLOGY
Credits: 3

An introduction to the field of psychology with emphasis on objective and systematic methods of inquiry. Extensive survey of major psychological topics including: biological basis of behavior, sensory systems, learning, cognition, emotions, consciousness, development, stress, personality, social factors and mental health.

PSY-200. STATISTICS
Credits: 4

An introduction to the use of statistical procedures (by hand and with SPSS) in the analysis of psychological data. Topics include descriptive statistics and inferential statistics. Techniques such as t-tests, ANOVA, correlation and regression will be used for hypothesis testing. It is recommended that students take this course at the end of their sophomore or their junior year. Psychology and Neuroscience majors must earn a 2.0 or higher in this course.

Pre-Requisites

[[PSY-101]] and Math competency (MTH 101 or higher).

PSY-221. DEVELOPMENTAL PSYCHOLOGY
Credits: 3

The course provides a general view of human growth and development from conception through the life span. Physical, cognitive, personal, and social development of the various stages of life will be presented. Discussions will include issues such as the influence of heredity versus environment and how these issues can be studied using various developmental research techniques.

Pre-Requisites

[[PSY-101]].

PSY-222. ADOLESCENT PSYCHOLOGY
Credits: 3

This course is designed as a study of the adolescent stage of life. Emphasis will be placed on the following areas of development: physical; emotional; cognitive; and social.

Pre-Requisites

[[PSY-101]].

PSY-242. PERSONALITY
Credits: 3

An examination of the major theoretical perspectives on personality development and functioning, with additional emphasis on the assessment of personality and research in personality.

Pre-Requisites

[[PSY-101]].

PSY-250. APPLIED BEHAVIOR ANALYSIS
Credits: 3

This course will explore the dynamics and management of human behavior. As such, the course will involve exercises with empirical research, statistics, literature searches and analysis with emphasis on the principles emanating from Operant and Pavlovian conditioning phenomena.

Pre-Requisites

[[PSY-101]].

PSY-257. NEUROPSYCHOLOGY
Credits: 3

A survey of the relationship between nervous system physiology and human behavior with emphasis on neurological disorders, neuropsychological assessment, head injury, cerebral asymmetry, and rehabilitation.

Pre-Requisites

[[PSY-101]].

PSY-264. POSITIVE PSYCHOLOGY
Credits: 3

Positive Psychology encompasses psychological theory and research about what makes our lives satisfying, purposeful, and "worth living", as well as what creates happiness and well-being. Students will examine the major theories and concepts of the field of positive psychology, and will engage in a variety of empirically-supported interventions designed to help them reach their fullest potential, improve overall quality of life, and enhance psychological well-being.

PSY-266. PEAK PERFORMANCE COACHING
Credits: 3

Peak Performance Coaching is a field of study and application with the aim of helping individuals reach their optimal level of performance. Students will learn and use multiple methods that can help clients with the process of setting and reaching goals. This course surveys and applies approaches such as Neurolinguistic Programming (NLP) and Life Coaching, employing techniques from these disciplines.

Pre-Requisites

[[PSY-101]]

PSY-300. RESEARCH METHODS
Credits: 4

A lecture and laboratory course designed to familiarize the student with the methods of psychological research. Hands-on experimental participation will give the student direct experience with research design and statistical analyses using SPSS. The student will prepare a formal APA style research proposal to be used for the capstone experience.
Click here for course fees.

Pre-Requisites

[[PSY-101]] and [[PSY-200]]. Students must have earned a 2.0 or higher in [[PSY-200]]. To be taken by Psychology or Neuroscience majors only, during the junior or senior year.

PSY-301. PSYCHOLOGICAL RESEARCH
Credits: 3

An introduction to how psychological research methods and statistics are used in academic journals and the popular media. The following topics will be discussed: scientific method, research methods used to gather evidence, descriptive statistics and hypothesis testing. Students will be asked to critically review and evaluate research findings.

Pre-Requisites

[[PSY-101]] and [[PSY-200]]. Students must have earned a 2.0 or higher in [[PSY-200]]. To be taken by Psychology majors only, during the junior or senior year.

PSY-309. CAREER MENTORING FOR THE SOCIAL SCIENCES
Credits: 2

This course will offer career guidance for students in the Behavioral and Social Sciences. The course will include topics such as mentoring, networking, résumés and interviewing skills.

Pre-Requisites

[[PSY-101]], junior standing. Course will be cross-listed with PS and [[SOC-309]] Course credits will not count towards minor credits. Open only to majors in the Social and Behavioral Sciences.

PSY-311. BEHAVIORAL NEUROSCIENCE
Credits: 4

A study of the physiological mechanisms mediating behavior and cognition. Emphasis on the structure and function of the nervous system and the neurophysiological bases of sensory processes, emotion, abnormal behavior, sleep, learning and memory, pain, and drug abuse. Laboratory experience includes brain dissection and psychophysiological techniques employed in human behavioral neuroscience research.
Click here for course fees.

Pre-Requisites

[[PSY-101]]; junior or senior standing.

PSY-331. COGNITION
Credits: 3

A survey of human cognitive processes such as attention, pattern recognition, memory, language, and problem solving as well as other selected aspects of human cognition. The course includes historical as well as current perspectives on cognitive issues and emphasis on the research techniques used.

Pre-Requisites

[[PSY-101]].

PSY-333. CRITICAL THINKING IN PSYCHOLOGICAL SCIENCE
Credits: 3

This course provides an opportunity to learn and practice the basic skills of critical thinking within the context of psychological science. Students will evaluate claims and theories in psychology, generate alternative explanations of psychological findings, identify common fallacies in thinking, construct and evaluate arguments, and learn how to become a more intelligent consumer of information. Additional topics include the interface of politics and the media with science and the dangers of pseudoscience.

Pre-Requisites

[[PSY-101]].

PSY-341. INTRODUCTION TO SOCIAL PSYCHOLOGY
Credits: 3

An introduction to the study of social behavior from a psychological perspective. Topics include attitude formation and change, conformity, leadership, culture, gender and sexuality, prejudice and discrimination. Cross listed with [[SOC-341]].

Pre-Requisites

[[ANT-101]], [[PSY-101]], or [[SOC-101]].

PSY-351. BEHAVIORAL MEDICINE
Credits: 3

This course provides a survey of the basic theoretical concepts and major issues in Behavioral Medicine. Specifically, this course examines how the areas of health, illness, and medicine can be studied from a psychological perspective. Topics of emphasis include the following: the psychological aspects of wellness and illness; preventive medicine; stress; chronic and terminal diseases (such as cancer and AIDS); and the use of alternative medicine.

Pre-Requisites

[[PSY-101]].

PSY-352. ABNORMAL BEHAVIOR
Credits: 3

A general survey of psychological disorders in children and adults with emphasis on symptomatology, etiology, and assessment. Forensic and classification issues are also examined.

Pre-Requisites

[[PSY-101]], [[PSY-242]].

PSY-353. CLINICAL METHODS IN PSYCHOLOGY
Credits: 3

A survey of the clinical methods in psychology including general therapeutic models and specific clinical techniques. Issues of assessment and diagnosis of psychological disorders are examined.

Pre-Requisites

[[PSY-101]]; [[PSY-242]]; [[PSY-352]]

PSY-354. THE EXCEPTIONAL INDIVIDUAL
Credits: 3

A study of the psychological, physical, and social challenges and needs of exceptional individuals with an emphasis on etiology, assessment, impact, and educational interventions.

Pre-Requisites

[[PSY-101]], [[PSY-221]].

PSY-355. FORENSIC PSYCHOLOGY
Credits: 3

A survey of the role that psychology has played in the legal system from issues of morality and theories of crime, to eyewitness testimony, the evaluation of criminal suspects, and jury selection. The application of the methods and theories of psychology to the legal system will be emphasized.

Pre-Requisites

[[PSY-101]]

PSY-356. INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY
Credits: 3

A survey of the applied areas of personnel, organizational, human factors, and consumer psychology.

Pre-Requisites

[[PSY-101]].

PSY-358. PSYCHOLOGICAL TESTS AND MEASURES
Credits: 3

A survey of the psychometric properties of various instruments and measures of psychological phenomena (especially intelligence and personality). A variety of group and individual tests are studied as to their reliability, validity, and utility.

Pre-Requisites

[[PSY-101]], [[PSY-200]].

PSY-359. PSYCHOPHARMACOLOGY
Credits: 3

A study of the effects and mechanisms of the action of psychoactive drugs on behavior. Focus will be placed on drugs used to treat psychopathological disorders and drugs of abuse. Topics of emphasis include a survey or stimulants, depressants, antipsychotics, antidepressants, psychedelics, and legal drugs, such as caffeine, nicotine, and alcohol.

Pre-Requisites

[[PSY-101]].

PSY-362. HISTORY OF PSYCHOLOGY
Credits: 3

A study of the philosophic and scientific roots of contemporary psychology, with emphasis on the applicability of past questions and knowledge to current psychological thought.

Pre-Requisites

[[PSY-101]].

PSY-398. TOPICS
Credits: 3

The study of a topic of special interest not extensively treated in other courses. Topics chosen according to interest of the instructor. Because of its variable content, this course may be repeated for credit.

PSY-399. COOPERATIVE EDUCATION
Credits: 1-3

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See the Cooperative Education section of this bulletin for placement procedures.)
Click here for course fees.

Pre-Requisites

Sophomore standing, minimum 2.0 cumulative GPA, consent of academic advisor, and approval of placement by the department chairperson.

PSY-400. RESEARCH CAPSTONE
Credits: 3

This course is designed to provide a research-based capstone experience for senior Psychology majors. Students will run an experiment, conduct the appropriate statistical analysis, and present the results formally in an APA manuscript, a poster, and in an oral presentation.
Click here for course fees.

Pre-Requisites

[[PSY-101]]; [[PSY-200]]; [[PSY-300]]; Senior status and departmental permission.

PSY-401. APPLIED CAPSTONE
Credits: 4

This course will offer a professional capstone experience, including a required internship experience. Students will prepare client case presentations based upon their observations during their internship. An internship is required prior to taking PSY 401 (PSY 399) and a second internship is required for this course, which is counted with the four credit requirement.
Click here for course fees.

Pre-Requisites

[[PSY-101]]; [[PSY-200]]; [[PSY-301]]; [[PSY-399]]; Senior status.

SM. SM

SM-201. INTRODUCTION TO SPORTS MANAGEMENT
Credits: 3
Terms Offered: Fall,Spring,Summer

This course is an introduction to the field of sport management. The course examines the historical development, current trends, best practices, and future trends of sport management.

Pre-Requisites

[[BA-152]] or [[BA-153]] with a minimum grade of 2.0.

SM-261. SPORT PSYCHOLOGY
Credits: 3
Terms Offered: Spring

Sport Psychology course is designed to help students learn the theoretical concepts, research and intervention skills in the psychology of sport and exercise. Students will learn different approaches to understand and evaluate psychological aspects of sport performance.

Pre-Requisites

[[SM-201]] with a minimum grade of 2.0

SM-325. SPORT MARKETING
Credits: 3
Terms Offered: Fall

Sport Marketing course is designed to provide students with a broad and contemporary overview of the sport marketing field. This course will compare and contrast the field of sport and entertainment marketing with the practices and applications of mainstream marketing.

Pre-Requisites

[[SM-201]] with a minimum grade of 2.0

SM-341. SPORT FINANCE AND ECONOMICS
Credits: 3
Terms Offered: Spring

Sport Finance and Economics course provides a comprehensive synopsis of the application of financial and economic management used in the sport organization decision making context from both a macro and micro level.

Pre-Requisites

[[SM-261]] or [[SOC-261]] with a minimum grade of 2.0

SM-355. FACILITY MANAGEMENT
Credits: 3
Terms Offered: Fall

Facility Management course is designed to provide students the opportunity to learn multiple aspects of sport facilities and the management of events held at these facilities. Students will gain an understanding of the breadth and complexity of facility planning issues in sport, and the tools necessary to effectively plan and manage sport facilities through hands on, experiential exercises coupled with classroom lectures, discussions, and guest speakers.

Pre-Requisites

[[SM-201]] with a minimum grade of 2.0

SM-461. CAPSTONE IN SPORT MANAGEMENT
Credits: 3
Terms Offered: Fall,Spring

This capstone class is the final course in the degree sequence for students majoring in Sports Management. Students will review, assess, and apply the concepts they have learned during undergraduate studies through the creation of a customized graduation portfolio.

Pre-Requisites

[[SM-325]] with a minimum grade of 2.0

SM-462. SPORTS MANAGEMENT INTERNSHIP
Credits: 3
Terms Offered: Fall,Spring,Summer

This course is designed to help students gain practical, hands on experience in the sport management field. Students will work directly with sport management professionals applying curricular theory and principles to real life situations.

Pre-Requisites

[[SM-201]] with a minimum grade of 2.0

SM-466. ADVANCED SPORTS MANAGEMENT INTERNSHIP
Credits: 3
Terms Offered: Fall,Spring,Summer

This course is designed to help students gain practical, hands on experience in the field of sports. Students will work directly with sport management professionals at a sport organization.

Pre-Requisites

[[SM-341]] with a minimum grade of 2.0

SOC. SOCIOLOGY

SOC-101. INTRODUCTION TO SOCIOLOGY
Credits: 3

A systematic view of sociology, providing essentials for an approach to questions about man in society; analysis of social processes, structures, and functions.

SOC-201. INTRODUCTION TO CRIMINAL JUSTICE
Credits: 3

This course introduces students to the American criminal justice system, with a focus on the interconnectedness of the major pieces: the police, the courts, and the correctional system. Benefits and limitations of the existing criminal justice system will be explored, along with growing threats to both society and the system itself.

Pre-Requisites

[[SOC101]] or Permission of Instructor

SOC-211. THE FAMILY
Credits: 3

History and ethnological studies of family. Role of family in the development of the individual. Interrelation of church, state, and family. Social conditions and changes affecting the American family. Family stability and disorganization.

Pre-Requisites

[[ANT-101]] or 102, [[SOC-101]], or approval of the instructor.

SOC-212. HUMAN SEXUALITY
Credits: 3

A balanced and thoughtful introduction to what is currently known about human sexuality. Research in sexuality comes from a variety of disciplines, including Psychology, Sociology, Biology, Medicine, Physical Education, and Human Education. Without assuming that the student has an extensive background in any of these fields, this course draws liberally on all of them and works hard to show how the biology, psychology, and sociology of sex are interrelated.

Pre-Requisites

[[SOC-101]] or approval of the instructor.

SOC-214. SEX ROLES
Credits: 3

This course deals with the origins of sex roles, the historical changes in sex roles, the consequences of sex roles to the individual and to society, and the outlook for sex roles in the future.

Pre-Requisites

[[ANT-101]] or 102, [[SOC-101]], or approval of the instructor.

SOC-215. FAMILY VIOLENCE
Credits: 3

It is customary to think of violence between family members as infrequent and, when it does occur, as being the result of some mental defect or aberration. Research evidence shows that neither of these views is correct. This course examines the prevalence, experience, causes, and prevention of family violence.

Pre-Requisites

[[ANT-101]] or [[ANT-102]], [[SOC-101]], or approval of the instructor.

SOC-220. VIOLENCE IN SOCIETY
Credits: 3

An overview of the causes, correlates, and history of violence in American society. Topics include the relationship between guns and gun control and violence, violence and popular culture, drug-related violence, and the development of organized crime and gangs in the United States.

Pre-Requisites

[[SOC-101]]

SOC-222. CRIMINOLOGY
Credits: 3

An analysis of the nature and extent of crime and the causes and prevention of criminality. Topic areas include the history of criminology, criminological research methods, the extent and patterns of crime, theories of criminal behavior, and current issues surrounding crime in the U.S. today.

Pre-Requisites

[[SOC-101]] or approval of the instructor.

SOC-223. DRUGS AND ALCOHOL IN AMERICAN SOCIETY
Credits: 3

An examination of drugs and alcohol in American society as a major social problem.

Pre-Requisites

[[SOC-101]] or approval of the instructor.

SOC-226. CORRECTIONS, PROBATION AND PAROLE
Credits: 3

A study of the agencies devoted to the correction and treatment of convicted offenders with a special focus on adult and juvenile probation, parole agencies supervising offenders in the community, as well as residential correction facilities, including jails, prisons, and juvenile institutions.

Pre-Requisites

[[SOC-101]] or approval of the instructor.

SOC-228. DEVIANCE AND SOCIAL CONTROL
Credits: 3

This course examines the nature of deviant behavior and the social responses to it. Topics covered include the following: what constitutes deviance; theories of deviance; varieties of deviant behavior; and the types of societal responses to deviant behavior.

Pre-Requisites

[[SOC-101]] or approval of the instructor.

SOC-231. FIELDS OF SOCIAL WORK
Credits: 3

A survey of the main problems of social work and of agencies and methods that have developed to cope with them. The nature and requirements of the different fields of social work.

Pre-Requisites

[[ANT-101]] or 102, [[PSY-101]], [[SOC-101]], or approval of the instructor.

SOC-234. GROUP COUNSELING
Credits: 3

Students enrolled in this course will learn about different types of group counseling services. Students will acquire knowledge of group practice issues for each phase in the evolution of groups. Students will develop initial competence in beginning work as a group leader or facilitator.

Pre-Requisites

[[SOC-101]].

SOC-235. CORRECTIONS COUNSELING
Credits: 3

Interviewing and intervention strategies in dealing with the criminal offender population in both prison and community settings, as well as the social services available for this population.

Pre-Requisites

[[SOC-101]] or approval of the instructor.

SOC-236. INDIVIDUAL COUNSELING
Credits: 3

Students enrolled in this course will gain knowledge of the counseling process, including values, goals, methods, and limitations. Students will learn about various client characteristics that impact the counseling relationship. Students will develop initial competence in delivering counseling services.

Pre-Requisites

[[SOC-101]].

SOC-251. SOCIOLOGY OF MINORITIES
Credits: 3

A theoretical analysis of inter-group tensions and processes of adjustment with special reference to modern racial, national, and religious conflicts, both domestic and abroad.

Pre-Requisites

[[ANT-101]] or 102, [[SOC-101]], or approval of the instructor.

SOC-252. RACE, CLASS, GENDER AND CRIME
Credits: 3

An examination of the relationship between social structure and crime, with an emphasis on developing and applying a critical perspective. Topics include the relationship between immigration and crime, the role of protests both contemporary and historically in shaping our attitudes about crime, the ways that socialization impacts criminality across race/class/gender boundaries, and ways in which the system can be improved.

Pre-Requisites

[[SOC-101]]

SOC-261. SOCIOLOGY OF SPORT
Credits: 3

An examination of sport from a social and cultural perspective. Emphasis is placed on examining how the institution of sport is a microcosm of American society, reflecting society's major cultural beliefs, and how the organization of sport reflects that of society.

Pre-Requisites

[[SOC-101]] or approval of the instructor.

SOC-263. THE URBAN ENVIRONMENT
Credits: 3

Cross-listed with [[PS-212]]. See description under the Political Science course listings.

SOC-309. CAREER MENTORING IN THE SOCIAL SCIENCES
Credits: 2

This course will offer career guidance for students in the Behavioral and Social Sciences. The course will include topics such as mentoring, networking, résumés and interviewing skills.

Pre-Requisites

[[SOC-101]], junior standing. Course will be cross-listed with PS and [[PSY-309]]

SOC-325. JUVENILE DELINQUENCY
Credits: 3

An examination of the nature and extent of juvenile delinquency, its causes, and its prevention. Topics include the similarities and differences between juvenile and adult justice systems, trends in juvenile delinquency, theories of delinquency, gangs, and the roles of family, schools, and legal institutions.

Pre-Requisites

[[SOC-222]]

SOC-341. INTRODUCTION TO SOCIAL PSYCHOLOGY
Credits: 3

A general survey of the field of social psychology. Social factors in human nature, psychology of individual differences, social interaction, collective behavior, psychology of personality, and social pathology. Cross listed with [[PSY-341]].

Pre-Requisites

[[ANT-101]] or 102, [[PSY-101]], [[SOC-101]], or approval of the instructor.

SOC-352. SOCIAL STRATIFICATION
Credits: 3

A survey of the structure and dynamics of social inequality in American life. Attention is focused on the institutionalization of power arrangements that perpetuate intergenerational patterns of economic, political, and prestige inequalities among collectivities. A special effort is made to compare the consequences of structured social inequality for the very wealthy and the very poor.

Pre-Requisites

[[ANT-101]] or 102, [[SOC-101]], or approval of the instructor.

SOC-360. WHITE COLLAR CRIME
Credits: 3

A broad introduction to the theoretical and practical concerns that arise in the study of white collar crime and other forms of deviance conducted by the upper class in a capitalist society. Theoretical aspects of governments and organizations are examined to further understand the damage to society caused by white collar crime.

Pre-Requisites

[[SOC-222]] or approval of the instructor.

SOC-370. QUANTITATIVE REASONING FOR THE SOCIAL SCIENCES
Credits: 3

This course is an introduction to quantitative analysis for the social sciences using SPSS, one of the most frequently and widely used statistical packages in the world. Students will learn how to enter and manipulate data in SPSS, apply and interpret statistics from descriptive through multiple regression, and test hypotheses using statistical methods. Cross listed with [[PS-265]].

Pre-Requisites

[[PS-261]], [[SOC-101]], [[SOC-371]], or approval of the instructor.

SOC-371. METHODS OF RESEARCH IN SOCIOLOGY
Credits: 3

Introduction to sociological research; selected problems of research in social relations; interviewing techniques; questionnaire design and case studies.

Pre-Requisites

[[SOC-101]] or approval of the instructor.

SOC-375. ADVANCED CRIMINOLOGICAL THEORY
Credits: 3

This course is designed for students currently taking the sociological methods course (SOC371) as part of the sociology and criminology capstone process. This course investigates the most common criminological theories students are likely to utilize for their own research projects. Theories are discussed with a focus on the operationalization of concepts of theory into variables that students may find in social science databases.

Pre-Requisites

[[SOC-222]] and [[SOC-370]].

SOC-381. SOCIOLOGICAL THEORY
Credits: 3

The aim of the course is provide the student majoring in sociology, or in one of the related fields, with an historical background necessary for understanding of the current trends in sociology as well as for clarification of its distinct subject matter, problems, and methods.

Pre-Requisites

[[SOC-101]] or approval of the instructor.

SOC-390. SENIOR CAPSTONE
Credits: 3

This course is intended for senior sociology majors. In this course you will complete an empirical research paper, quantitative or qualitative, and present the results to an audience of faculty and peers.

Pre-Requisites

[[SOC-370]], [[SOC-371]], [[SOC-381]].

SOC-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See the Cooperative Education section of this bulletin for placement procedures.)

Pre-Requisites

Sophomore standing, minimum 2.0 cumulative GPA, consent of academic advisor, and approval of placement by the department chairperson.

SP. SPANISH

SP-101-102. ELEMENTARY SPANISH
Credits: 3 each

Fundamentals of spoken and written Spanish, and introduction to Spanish culture. Emphasis is placed on communicative proficiency.

Pre-Requisites

Completion of Spanish Placement Test.

SP-203-204. INTERMEDIATE SPANISH
Credits: 3 each

Continuation of development of communicative skills in Spanish. Includes review and further study of grammar. Oral and written work based upon short cultural and literary texts. Intended for non-fluent Spanish speakers.

Pre-Requisites

[[SP-102]], appropriate Spanish Placement Test score or permission of the instructor.

SP-205. CONVERSATION
Credits: 3

Practice in spoken Spanish, including discussions, oral presentation, and role-playing. Includes written exercises. Intended for non-fluent Spanish speakers.

Pre-Requisites

[[SP-204]] or permission of the instructor.

SP-206. ADVANCED GRAMMAR, STYLISTICS, AND COMPOSITION
Credits: 3

Practice in written and oral skills, with an emphasis on the refinement of grammatical and stylistic abilities.

Pre-Requisites

[[SP-204]] or permission of the instructor.

SP-208. CULTURE AND CIVILIZATION
Credits: 3

Systematic introduction to the political, social, economic, and cultural characteristics of Spain from the Middle Ages to Modern Times. Readings from a variety of sources including the Spanish press.

Pre-Requisites

[[SP-204]] or permission of the instructor.

SP-209. LATIN AMERICAN CULTURE AND CIVILIZATION
Credits: 3

Systematic study of the historical, cultural, economic, and political development of the countries of Latin America (Spanish-speaking countries and Brazil). Pre-Columbian cultures (Maya, Aztec, and Inca) will be examined. Use of audio-visual material and other activities included.

Pre-Requisites

[[SP-204]] or permission of the instructor.

SP-210. SPANISH FOR BUSINESS
Credits: 3

Introduction to language use in the contemporary Spanish business world, including practice in reading, understanding, and writing business communications.

Pre-Requisites

[[SP-204]] or permission of the instructor.

SP-211. CONVERSATIONAL SPANISH FOR HEALTH AND SOCIAL SERVICES
Credits: 3

Designed to provide the students with the basic terminology and conversational skills in Spanish for the health care field and the social services area. Work on special problems of grammar and idiomatic expression.

Pre-Requisites

[[SP-204]] or permission of the instructor.

SP-212. COMPARATIVE GRAMMAR THROUGH TRANSLATION
Credits: 3

This course provides a grammatical comparison between Spanish and English by translating sentences and paragraphs in both languages. By comparing the two languages, non-native Spanish-speaking students will deepen their understanding of Spanish as well as learn more about their own languages. The focus is on syntax and vocabulary.

Pre-Requisites

[[SP-203]]-204 or permission of the instructor.

SP-219. CULTURE IN CONTEMPORARY SPAIN
Credits: 3

This course covers the main aspects of the political, economic, and social circumstances in contemporary Spain. It provides an overview of the history, politics, and culture of contemporary Spain, a country has experienced drastic changes in the last decades and continues to face old and new challenges. The focus will be on developing an understanding on the main events that has influenced current politics and modern culture. The class is taught in Spanish and it aims to equip students with the appropriate skills for a critical analysis of current events.

Pre-Requisites

[[SP-204]] or permission of the instructor.

SP-220. SPANISH LISTENING AND COMPREHENSION
Credits: 3

'Listening and Comprehension' develops a better understanding of spoken colloquial Spanish. Students will work with audio and audio-visual materials that engage cultural topics connected to language use in Hispanic countries. Intended for non-native speakers.

Pre-Requisites

[[SP-205]], [[SP-206]] or permission of the instructor.

SP-301. INTRODUCTION TO LATIN AMERICAN LITERATURE
Credits: 3

An examination of literary language, genre conventions, and critical approaches, as well as an introduction to Spanish literary history.

Pre-Requisites

[[SP-205]], 206 or permission of the instructor.

SP-307. SURVEY OF SPANISH LITERATURE I
Credits: 3

[[SP-307]] is a systematic survey of peninsular (Spanish) literature from the Middle Ages through the 'Illustración' or Neoclassicism literary periods, including a variety of genres. This course provides an overview of the development of literary movements throughout history.

Pre-Requisites

[[SP-205]], 206 or permission of the instructor.

SP-308. SURVEY OF SPANISH LITERATURE II
Credits: 3

[[SP-308]] is a systematic survey of Spanish literature from Romanticism through the contemporary literary periods, including a variety of genres. This course provides an overview of the development of literary movements throughout history.

Pre-Requisites

[[SP-205]], 206 or permission of the instructor.

SP-310. WOMEN IN LITERATURE
Credits: 3

This course maps the evolution of women's rights, emancipation and freedom from 1600s to present following a social and multicultural approach. The course covers canonical and non-canonical writers in the Spanish-speaking world and discusses the political, social and historical context of writers in specific historical periods and countries, including the main socio-political and cultural events forces that have shaped women in these countries. Comparisons and contrasts within the different geographical areas and the United States will be also analyzed.

Pre-Requisites

[[SP-204]] or permission of the instructor.

SP-390. SENIOR PROJECTS: CAPSTONE
Credits: 1

An independent project culminating in a formal research project and presentation. The project serves as a capstone experience demonstrating the student's learning in the major. Open only to senior Spanish majors.

SP-397. SEMINAR
Credits: 1-3

Presentations and discussions of selected topics. Maximum of three credits per student.

SP-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See the Cooperative Education section of this bulletin for placement procedures.)

Pre-Requisites

Sophomore standing, minimum 2.0 cumulative GPA, consent of academic advisor, and approval of placement by the department chairperson.

STE. STUDY TOUR EXPERIENCE

STE-300. STUDY TOUR EXPERIENCE
Credits: 3

This course, intended for use by all departments, is designed to offer students the opportunity to experience another culture through an intensive period of study and travel abroad under the guidance of a knowledgeable instructor. The Study Tour Experience has four components: a pre-travel orientation; the concentrated group travel experience; a writing emphasis; and a post-travel follow-up session. Students will be expected to keep a journal during the entire experience that will serve as a reference for the post-travel discussions and paper or project assignment. The travel itself ranges from ten to fourteen days and is scheduled during winter break intersession, spring break, or summer sessions. Scheduling is specifically intended to provide expanded travel opportunities for those students who might not otherwise be free to travel abroad within a semester due to the constraints of tightly sequenced courses within their majors. (10 classroom hours; 10-14 days of fieldwork)

SUS. SUSTAINABILITY MANAGEMENT CERTIFICATE

SUS-401. INTRODUCTION TO SUSTAINABILITY
Credits: 3

This course serves as an introduction to the concept of sustainability and will investigate why knowledge of sustainability issues and initiatives is an important business management and operational tool. This course is the first in a series of four courses in the Certificate Program in Sustainability Management.

Pre-Requisites

There are no pre-requisites for this course.

SUS-402. METRICS OF SUSTAINABILITY
Credits: 3

Metrics of sustainability are the tools and procedures that are utilized to measure the impact and progress of a sustainability management program. These metrics are important because they enable goal setting and facilitate the adoption of sustainable practices. In this course current sustainability reporting and tracking systems will be studied. This course is the second in a series of four courses in the Certificate Program in Sustainability Management.

Pre-Requisites

[[SUS-401]]

SUS-403. SUSTAINABILITY IMPLEMENTATION
Credits: 3

Students will learn about implementing sustainability management systems through an in-depth study of a manufacturing facility. Key topics to be studied include: setting sustainability goals, development of an environmental policy statement, development of sustainability metrics and sustainability reporting. This course is the third in a series of four courses in the Certificate Program in Sustainability Management

Pre-Requisites

[[SUS-401]] and [[SUS-402]]

SUS-404. INDUSTRY-FOCUSED SUSTAINABILITY
Credits: 3

In this course students will perform an in-depth study of sustainability standards and practices in the context of a specific industry. This course is the last in a series of four courses in the Certificate Program in Sustainability Management

Pre-Requisites

[[SUS-401]], [[SUS-402]], [[SUS-403]]

THE. THEATRE ARTS

THE-100. APPROACH TO THEATRE
Credits: 3

Attention will be directed to the importance of the dramatic imagination in reading and viewing plays, with the objective of developing a critical appreciation of the theatre. Lecture, discussion, demonstration, films, college, and professional theatre performances.

THE-121. STAGECRAFT I
Credits: 3
Terms Offered: Fall

An exploration of the many physical facets of theatrical production by introducing the student to the process of translating the concept of a design into physical actuality and of adapting a production to the requirements of a stage. Class and workshop.

THE-131. ACTING I
Credits: 3

Basic acting techniques. Creating a variety of characters for the stage through the use of vocal interpretation, physical movement, improvisation, and theatre games.

THE-132. VOICE AND DICTION I
Credits: 3

Applied course introducing voice and speech training that combines practical vocal exercises with a method of analyzing and correcting speech problems. The expectation of the course is improvement in the voice and speech work of the individual student, as well as increased body awareness.

THE-190. THEATRE LABORATORY
Credits: 1-3

The production aspect of theatre including rehearsals, performances, scene shop, costume shop, lighting shop, propshop, stage management and box office. Required of Theatre Arts and Musical Theatre majors every semester. Click here for course fees.

THE-191. -291-391-491 DEPARTMENT PRACTICUM IN THEATRE PRODUCTION
Credits: 1-3

Credits can be awarded for a major contribution to Theatre Program productions. Approval required from the Director of Theatre.

THE-198. -298-398-498 TOPICS
Credits: 1-3

A study of topics of special interest not extensively treated in regularly offered courses.

THE-211. THEATRE HISTORY I
Credits: 3

A survey of the historical development and background of theatrical art from ancient times through the seventeenth century.

THE-214. SCRIPT ANALYSIS
Credits: 3

An approach to dramatic literature for the theatre artist to read, interpret, and analyze dramatic texts for production and performance values.

THE-216. DESIGN FOR THE THEATRE
Credits: 3

This class will explore through lecture and practical exercises the skills and concepts needed to produce scenic, lighting, and costume designs for the theatre.

THE-217. AUTOCAD FOR THE STAGE
Credits: 3

This class will develop familiarity with using AutoCAD as a tool for generating drawings for the stage. Offered every other year.

THE-219. SOUND DESIGN
Credits: 3

This class develops the knowledge base and skills necessary to execute the Sound Design of a live theatrical performance. Topics include a basic working knowledge of sound equipment, sound itself, and industry-standard show control software. Offered every other year.

THE-220. STAGECRAFT II
Credits: 3

Advanced exploration of the many physical facets of theatrical production in order to refine the process of translating the concept of a design into physical actuality and of adapting a production to the requirements of a stage. Class and workshop.

THE-222. LIGHTING DESIGN
Credits: 3

An introduction to designing lighting for theatre. Emphasis on the development of visual skills, idea development (script and image), and notation. Production work is required.

THE-224. RENDERING FOR THE THEATRE
Credits: 3

An introduction to drawing skills, rendering and visual communication for theatre.

THE-225. HISTORIC SCENIC STYLES
Credits: 3

A survey of art through design projects for the theatre.

THE-226. SCENIC PAINTING
Credits: 3

An introduction to scene painting techniques, methods, approaches and applications used by the scenic artist.

THE-227. COSTUME DESIGN
Credits: 3

An introduction to the basic elements of Costume Design including: Line, Mass, Form, Balance, Hue, and Chroma. Class projects provide an opportunity for the student to render costume sketches, analyze plays, research costume history, and construct basic pattern shapes. Offered every other year.

THE-228. STAGE MAKEUP
Credits: 3

This course offers students the opportunity to learn and apply the fundamental principles of standard, character and special effects stage makeup. Offered every other year.

THE-230. STAGE MANAGEMENT
Credits: 3

An introduction to the art of stage managing a live theatre performance. Offered every other year.

THE-232. ACTING II
Credits: 3

An introduction to the major theories, aims, and styles of acting through performing various roles and monologues in selected dramatic scenes.

Pre-Requisites

[[THE-131]].

THE-233. VOICE AND DICTION II
Credits: 3

Applied course that continues the refinement of vocal expressiveness and interpretation exploring colloquial and complex texts for purposes of oral communication of the written texts.

THE-234. DIRECTING I
Credits: 3

An introduction to the principles of directing, including play selection, composition, casting, blocking, and rehearsing. Class and workshop.

Pre-Requisites

[[THE-131]] or departmental permission.

THE-311. THEATRE HISTORY II
Credits: 3

A survey of the historical development and background of theatrical art from the eighteenth century to the present.

THE-321. SCENIC DESIGN
Credits: 3

Introduces through practical exercises concept development and skills needed to produce scenic designs for the theatre.

THE-331. ACTING III
Credits: 3

Attention to special problems in acting in terms of classical style. Continued self-discovery through improvisation, kinesthetic awareness, and other basic acting techniques learned in [[THE-232]] are expanded upon.

Pre-Requisites

[[THE-131]], [[THE-132]], [[THE-232]], or permission of the instructor.

THE-334. DIRECTING II
Credits: 3

A study of special problems in directing. Students will prepare a prompt book, critique productions, and direct a one-act play.

Pre-Requisites

[[THE-234]].

THE-394. THE BUSINESS OF THEATRE/AUDITIONS
Credits: 1-3

Discussion of information and preparation to navigate the theatrical and entertainment industries.

THE-395. -396 INDEPENDENT RESEARCH
Credits: 1-3

Independent study and research for advanced students in theatre under the direction of a faculty member. A research paper at a more substantial level beyond a term paper is required.

Pre-Requisites

Approval of the department chairperson.

THE-399. COOPERATIVE EDUCATION
Credits: 1-6

Professional cooperative education placement in a private or public organization related to the student's academic objectives and career goals. In addition to their work experience, students are required to submit weekly reaction papers and an academic project to a Faculty Coordinator in the student's discipline. (See the Cooperative Education section of this bulletin for placement procedures.)

Pre-Requisites

Sophomore standing, minimum 2.0 cumulative GPA, consent of academic advisor, and approval of placement by the department chairperson.

THE-431. ACTING IV
Credits: 3

Scene study, analysis, and development of acting theories for a sophisticated preparation of audition material and rehearsal technique for the working actor.

Pre-Requisites

[[THE-131]], 132, 232, 331, or permission of the instructor.

THE-493. SENIOR CAPSTONE
Credits: 1-3

Individual performance project intended to inspire students to take on responsibility for self-governance and, through effort, create a meaningful expression of their aesthetic.

WS. WOMEN'S AND GENDER STUDIES

WS-301. INTRODUCTION TO WOMEN'S AND GENDER STUDIES
Credits: 3

This course introduces students to theoretical assumptions that underlie the social construction of gender and the historical development of feminist thought. Students are also exposed to a variety of contemporary issues related to gender, sexuality, race, culture, class, the family, reproduction, and language in light of these theoretical assumptions. Students are expected to complete a senior capstone project that addresses gender as a category of analysis to be presented at the annual Women's and Gender Studies conference. Offered every spring semester.

Pre-Requisites

Junior or senior status.