

General Education Requirements

Culture & the Common Good: A Liberal Arts Education at Fontbonne University

General Education provides Fontbonne graduates with a true liberal arts education, designed to prepare students to become ethical and informed global citizens who are able to contemplate complex ideas and generate creative solutions. It focuses on developing skills, knowledge and values to this end. General Education requirements include Mission Core, Foundations, Pillars, Bridges and Writing Intensive courses.

Through general education at Fontbonne, students will develop the following:

- Intellectual and practical proficiencies critical for application across the curriculum, in interdisciplinary inquiry, and in the wider world
- Knowledge of human cultures and the physical and natural world, engagement with questions both contemporary and enduring
- Ethical and responsible attentiveness to the pursuit of justice and the common good in pluralistic contexts

Additional information about General Education can be found in the undergraduate academic information section of this catalog.

Other Programs

Culture and Common Good

Mission Core: 6 Credits

These courses integrate Fontbonne's Mission, Vision, and Values and a global perspective into the curriculum.

Mission Core I: 3 credits

INT 105 - Mission Core I: Culture and the Common Good

Credit(s): 3

This course will explore the meaning of the term "the common good" in the context of different traditions. The course will draw examples from a wide variety of disciplines and subject areas. Students are challenged to explore their roles as individuals, as members of multiple cultures or faiths, and as global citizens in promoting the "common good." The course also includes a component designed to assist first-year students in effective learning and study strategies. FA

Mission Core II: 3 credits

ART 207 - High Art, Propaganda, and Kitsch

Credit(s): 3

Meets the specialized valuing component of the general education requirements. Through the examination of works of art and artists, students will evaluate the uses of art, both current and historical, to better understand the role it has in contemporary society, and the methods used in critiquing art. FA

BIO 203 - Science and Society**Credit(s): 3**

An introductory course examining the history of science and technology, with an emphasis on modern science, as well as the philosophy of scientific and technological thought. This course will also explore the reciprocal effects of science on society and society on science. this course has been approved to meet the Writing Intensive General Education Requirement. Annually

EDU 268 - Introduction to Learner Development**Credit(s): 3**

This course investigates the psychological development of the child and adolescent through exploring prior experiences and how they impact learning. This course includes an examination of instructional strategies that promote critical thinking and instructional resources, including media communication tools that benefit the teaching and learning processes. Strategies for content literacy are explored through academic language, teaching methodologies, and consultation and collaboration. Mission Core II Course FA, SP

ENG 203 - Writing for Social Justice**Credit(s): 3**

Explores the role of rhetoric and written communication in social justice activism, as conceptualized from Catholic social teaching. Students will learn to analyze public rhetorical situations surrounding social justice issues and to employ effective rhetorical strategies in the production of common public genres, both print and digital, such as opinion-editorials, letters to editors, videos, white papers, letters to congress, manifestos, etc. in support of social justice causes. The course may include a community engagement component requiring students to work with a community social justice organization. SP Even

ENG 363 - Literature and Religion**Credit(s): 3**

Study of literary works, authors, and themes related to religious or spiritual belief. Explores issues or organized religion, spiritual belief and religious practices as they are represented in literature. Note: the specific topics of the course may vary by semester. (GTM).

FCS 340 - Family Resource Management and Relations**Credit(s): 3**

Study of the availability of resources to individuals and families. Stresses management processes necessary for the satisfaction of needs and achievement of goals. Focus is on family dynamics and the relationships of family with social institutions. Additional service learning hours are required beyond the scheduled class meeting times. This course has been designated as a service learning course by the university. FA, SP

GS 201 - Globalization and Its Challenges

Credit(s): 3

A global look at the development of neo-liberalism (modernization) since the collapse of the Soviet Union and the shrinking of the welfare state in the West. With sufficient demand.

MGT 330 - Management and Business Ethics**Credit(s): 3**

A study of the process and criteria for forming and testing values and relating them to ethical obligations. Personal values are examined in relation to organizational values. Ethical systems are studied and applied to organizational and public policy issues. FA, SP

PHL 221 - Business Ethics**Credit(s): 3**

A systematic overview of normative ethics and a comprehensive discussion of contemporary moral issues in a business context. Employs actual case studies drawn from business, as well as readings from a wide range of thinkers. FA, SP

PHL 228 - Environmental Ethics**Credit(s): 3**

This course will explore the meaning of environmental justice, the human impact on the environment, global food shortages and environmental concerns, and the relation of hunger and poverty to the environment. It will also explore Catholic Social Teaching Perspectives, especially care for God's creation, and the common good and the environment. On demand

SWK 250 - Generalist Social Work Practice I**Credit(s): 4**

This is the first course in the practice methods sequence, in which students are introduced to the knowledge, values, and skills, within the framework of generalist social work practice. The application of generalist practice skills including assessing personal competence, interviewing, assessment, intervention, resource referral, communication, and documentation will be presented. Generalist practice skills will be integrated with strengths-based, empowerment, ecosystems, and evidence-based practice frameworks. Emphasis will be placed on generalist practice models of intervention-case management, advocacy, solution-focused counseling, and crisis/trauma management with diverse clients. The interaction and effectiveness between social service agencies and social welfare policy in responding to social problems will be explored. FA,SP

Foundations: 17 credits

These courses form the *foundation* of a solid liberal arts education.

Written Communication: 6 credits**ENG 101 - Composition I****Credit(s): 3**

Focuses on the development of a writing process. Students learn various strategies for exploring and focusing their thinking. Practice in developing a thesis, choosing a rhetorical strategy, and communicating clearly, correctly, and effectively. Frequent student writing, evaluation, and revision; conferences. FA, SP

ENG 102 - Composition II

Credit(s): 3

Critical study and textual analysis of expository essays; emphasis on critical thinking, analysis, and argumentation as well as on developing increasing stylistic sophistication. Review of the tools of research. FA, SP, SU

Prerequisite(s): ENG 101 or equivalent.

Oral Communication: 3 credits

COM 101 - Communication in Everyday Life

Credit(s): 3

In this introductory course, students will learn about core concepts and contexts of study in the field of Communication, critically consider the role of communication in their everyday lives, and develop and deliver formal speeches. Topics covered include communication in personal relationships, communication in the workplace, mediated communication, and informative and persuasive speaking. FA, SP, SU

COM 102 - Public Speaking

Credit(s): 3

Acquaints the student with a sound approach to the preparation and delivery of informative and persuasive speeches. Students will study the fundamentals of organization, outlining, and supporting materials and apply these principles in the planning and delivery of several speeches before the class. Open to all students. FA, SP

Mathematics: 3 credits

MTH 102 - Mathematics for Elementary School Teachers: Number Systems, Geometry and Measurement

Credit(s): 3

Problem solving, elementary set theory and logic, development of the real number system. Topics in geometry and statistics. Enrollment limited to students in the following programs: Pathways, Deaf Education, and Early Childhood, and to students in Elementary Education/Special Education, who have transferred into Fontbonne with previous mathematics credit. SP

Prerequisite(s): Grade of C- or better in MTH 095 or consent of the instructor.

MTH 103 - Excursions into Modern Mathematics

Credit(s): 3

This course presents mathematics in such a way that the student can see immediate connections between what is learned in the mathematics classroom and real-life problems. It is geared toward liberal arts majors. The choice of topics is such that a heavy mathematical infrastructure is not needed. A fundamental objective of the course is to develop an appreciation for the aesthetic elements of mathematics. SP

Prerequisite(s): Grades of B or better in MTH 091 or competency in arithmetic.

MTH 105 - College Algebra

Credit(s): 4

Topics covered: sets, number systems, polynomials, equations and graphing, inequalities, relations and functions,

systems of equations, exponential and logarithmic equations, rational zeros of polynomials, matrices and determinants, sequences and series. Students in this course who choose a major in the department must earn grades of B- or better in this course to progress to MTH 150. FA, SP

Prerequisite(s): Grade of C- or better in MTH 095, or competency in arithmetic and algebra.

MTH 106 - Mathematics for Elementary School Teachers: Geometry and Measurement

Credit(s): 3

Examines the structures and properties of mathematics through problem solving. Includes the study of geometry, measurement and probability and statistics. Utilizes appropriate grade-level technology. Intended for prospective elementary school teachers. (Students, who have previously completed MTH 102, cannot receive credit for this course.)
SP

Prerequisite(s): Grade of C- or better in MTH 104 or its equivalent.

MTH 110 - Precalculus

Credit(s): 4

Prepares students for MTH 150 - Calculus with Analytic Geometry I. The course is an in-depth study of the concept of a function. Several classes of functions including linear, quadratic, polynomial, rational, exponential, logarithmic, and trigonometric functions are studied. Within each class of functions, characteristics of the function are emphasized such as the basic form and graph, equations and inequalities associated with the function, and applications. Both algebraic and graphical techniques will be used throughout the course. FA

Prerequisite(s): Grade of B or higher in MTH 095 or equivalent knowledge.

MTH 115 - Introduction to Statistics

Credit(s): 3

Topics covered: descriptive statistics, probability, binomial, chi-squared and normal probability distributions, tests of hypotheses, linear correlation and regression, and analysis of variance. FA, SP, SU

Prerequisite(s): Grades of C- or better in MTH 095 or competency in arithmetic and algebra.

MTH 150 - Calculus with Analytic Geometry I

Credit(s): 4

Differential and integral calculus of the algebraic and transcendental functions associated with analytic geometry. SP

Prerequisite(s): Three years of high school mathematics including trigonometry with grades of B or better, or MTH 110 (with a grade of C- or better), or (MTH 105 and MTH 108) with grades of C- or better, or the consent of the instructor.

Management Information: 4 credits

LIB 199 - Information Literacy in Higher Education

Credit(s): 1

Students will learn how to evaluate information, synthesize ideas, recognize the value of collaboration, and think critically about their use of information in personal, social, and academic contexts. Through a series of interconnected learning modules, the course will address the wide range of skills needed to understand and ethically engage in all areas of an evolving information culture. FA, SP, SU

AND

CIS 100 - Computer Technology: Issues and Applications

Credit(s): 3

Provides an introduction to applications of information technology for non-computer science majors. The course covers general computer knowledge associated with computer history, hardware, software, operating systems, and computer networks. Students learn and/or reinforce skills related to word processing, spreadsheets, presentation and publishing tools as well as to emerging internet-based tools. Social and ethical issues related to technology are considered, such as piracy, viruses, and security issues. Course will include the development of an application project by the student.

FA,SP, SU

CIS 103 - Computer Technology: Applications for Educators

Credit(s): 3

Provides an introduction to the uses of technology in an educational setting. Emphasis of the course will be on integrating technology with classroom instruction. Students will learn skills related to word processing, spreadsheets and presentations as well as to evolving internet-based technologies. Promoting life-long learning and an understanding of the legal and ethical use of computer/technology resources will be an integral part of the course. FA, SP

CIS 110 - Computer Applications: Spreadsheet

Credit(s): 3

Covers capabilities of Windows-based spreadsheet software. Presents spreadsheet terminology, basic commands, and features for data formatting, calculation, and creating tables and charts. Additional topics include building applications for data referencing, analysis and reports, advanced functions, and macros. Course will include development of a significant spreadsheet project by the student. FA, SP

CIS 111 - Computer Applications: Database

Credit(s): 3

Covers the skills to design and implement a database as well as data entry, editing, and manipulation using Windows-based DBMS software. Includes applications of managing tables and files, using and creating queries, and designing forms and reports. Course will include development of a significant database project by the student. Offered as Needed.

CIS 160 - Computer Science I

Credit(s): 4

Emphasis on programming in C and introduction to C++, including structural programming concepts, simple data types and structures, C and C++ syntax, operators, control structures secure coding skills. Lab exercises include techniques of coding, program design, and debugging. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information science must earn grades of B- or better in this course to progress to CIS 161 and/or CIS 210. FA

Prerequisite(s): Grade of B or better in MTH 095 or competency in arithmetic and algebra. For CS, Cybersecurity or MIS majors, CIS 120 is a pre- or co-requisite.

CIS 200 - Scientific Computing Languages

Credit(s): 3

Covers an introduction to scripting languages and their applications to scientific data (currently Python programming language and the R-statistical analysis program will be taught). SP

Prerequisite(s): (MTH 125 or MTH 115)

State and National Government: 1-3 credits

GOV 101 - U.S. and Missouri Constitutions

Credit(s): 1

This brief course will study the text of both the U.S. and Missouri Constitutions and discuss their relevance in today's environment. FA, SP

GOV 230 - American National Government

Credit(s): 3

Historical background, organization, and functions of the American National Government; study of the operation of the Constitution and the Bill of Rights in today's environment and a study of the current political process in the United States. SP

Pillars of Knowledge: 18 credits

Pillars courses *build* on Fontbonne's Foundations courses. Students select one course from six of the seven categories listed (minimum 3 credit hours each), to include at least one laboratory science course.

Social and Behavioral Sciences

ECN 210 - Principles of Macro Economics

Credit(s): 3

Macroeconomics is concerned with keeping economic fluctuations within reasonable bounds. Topics include the measurement of the national income, inflation, unemployment, economic growth and monetary and fiscal policies and international outcomes. FA, SP, SU

Prerequisite(s): BSA 100 (may be taken concurrently).

ECN 220 - Principles of Micro Economics

Credit(s): 3

Microeconomics, or the theory of the firm, explains price determination and resource allocation. Topics include the supply/demand model, elasticity, the theory of consumer behavior, the theory of production and cost of production, and an examination of various market structures. FA, SP, SU

Prerequisite(s): BSA 100 (may be taken concurrently).

GGY 205 - Cultural Geography

Credit(s): 3

A meaningful way of looking at earth, not a mere inventory of its contents. Emphasis on socio-cultural diversity. FA
Odd

GOV 230 - American National Government

Credit(s): 3

Historical background, organization, and functions of the American National Government; study of the operation of the

Constitution and the Bill of Rights in today's environment and a study of the current political process in the United States. SP

PSY 100 - Introduction to Psychology

Credit(s): 3

A general introduction to the discipline of psychology. The course examines the historical and theoretical foundations of modern psychology and surveys the various topical areas that use scientific methodology to study and explain human behavior and mental processes. Topics considered include biological foundations, sensation and perception, motivation and emotion, human development, personality, social psychology, psychological disorders, and therapy. FA, SP, SU, Online

PSY 200 - Developmental Psychology

Credit(s): 3

A study of the nature of human development across the life span. The course covers the physical, cognitive, and psychosocial development of the individual for each of the major developmental periods: infancy, childhood, adolescence, and adulthood. The psychosocial experience of aging and death is also examined. FA, SP, SU, Online

PSY 310 - Social Psychology

Credit(s): 3

Cross-listed with: SOC 310.

An examination of human social behavior. Primary focus is on the behavior of individuals in social contexts. The course examines scientific theories and research on the ways people think about, influence, and relate to one another. Topics include attribution theory, attitudes, persuasion, conformity, prejudice, aggression, and altruism. SP (Even Years)

Prerequisite(s): PSY 100 or SOC 100.

SOC 100 - Survey of Sociology

Credit(s): 3

An examination of the definition, scope, and basic concepts of sociology; scientific approach to the study of society; practical application of concepts learned. FA, SP, Online

SOC 115 - Social Problems

Credit(s): 3

An examination of contemporary American social issues such as alcohol and drugs, sexual deviance, prejudice, poverty, and mental illness. Students deal with theories as well as actual problem situations. SP

SOC 265 - Diversity Studies

Credit(s): 3

An introduction to central debates in the sociological literature on diverse groups. Discussion of issues such as power and inequality, prejudice and discrimination, social justice, and social policy. FA

SOC 310 - Social Psychology

Credit(s): 3

Cross-listed with: PSY 310.

An examination of human social behavior. Primary focus is on the behavior of individuals in social contexts. The course examines scientific theories and research on the ways people think about, influence, and relate to one another. Topics include attribution theory, attitudes, persuasion, conformity, prejudice, aggression, and altruism. SP (Even years)

Prerequisite(s): SOC 100 or PSY 100.

SSC 201 - The American Economy

Credit(s): 3

A study of the development of the American economy from the colonial period to its present position as a major world economic power. A study of economic theory-how the American economy works today through the free market system and regulation, and what the future may hold. Alternate even years FA

Literature

ENG 120 - Introduction to Literature

Credit(s): 3

Develops an appreciation for literature through the study of fiction, poetry, and drama; introduction to literary analysis, including critical terms; practice in writing about literature. FA, SP, SU

ENG 220 - Women's Literature

Credit(s): 3

An introduction to the contributions of female writers. The goal of this course is to develop an awareness of how gender may influence the content and form of literature by women. Students will examine the varied components of a gendered identity, the ways they are represented in literature, and the effects they have had on a wide range of women writers. (LC) Every fourth SP

ENG 240 - Survey of English Literature to 1789

Credit(s): 3

Consideration of important movements, writers, and works from Beowulf to the Augustan era. (pre-1865) FA

ENG 241 - Survey of English Literature since 1789

Credit(s): 3

Consideration of important movements, writers, and works from the Romantic Movement to the 20th century. SP

ENG 251 - World Literature

Credit(s): 3

An introduction to the study of world literature written originally in English or in translation. Detailed literary analysis and attention to cultural contexts. (LC) Offered as needed

ENG 255 - African-American Literature

Credit(s): 3

An introduction to the literature of African Americans from the slave narrative to the present and an opportunity to analyze and interrogate issues of race, identity, and gender in the works of African-American writers. Offered even years. (AL, LC) Every fourth SP

ENG 260 - Survey of American Literature to 1865

Credit(s): 3

Consideration of important movements, writers, and works from the Colonial Period to the Civil War; examination of colonial literature, revolutionary literature, the slave narrative, transcendentalism, and the sentimental novel. (pre-1865) FA

ENG 261 - Survey of American Literature since 1865

Credit(s): 3

Consideration of important movements, writers, and works of the late 19th century and of the 20th century; emphasis on realism, naturalism, regionalism, modernism, and postmodernism. SP

Philosophy

PHL 110 - Introduction to Philosophy

Credit(s): 3

An invitation to the art of wondering; a course designed to help students understand what philosophy is, its aims and methods, and to acquaint them with representative issues, e.g., God, knowledge, the good. FA, SP

PHL 260 - Contemporary Moral Issues

Credit(s): 3

An introduction to ethical theories and their application to a wide range of issues, e.g., sexuality, abortion, capital punishment, affirmative action, euthanasia. FA, SP

PHL 323 - Existentialism and the Meaning of Life

Credit(s): 3

A challenge to traditional thinking about life's meaning. Pre- and Post- World War II thought from Kierkegaard to Foucault will be explored. Are we born with purpose, or are we the creators of it? This course investigates that which forms the self.

History

HST 103 - Introduction to Western Civilization I: Prehistory to 17th Century

Credit(s): 3

Covers prehistory, ancient history (Greece, Rome, Christianity, the Germanic Invasions), medieval history, early modern history (Renaissance and Reformation), and early 17th Century. Considers political, social, economic, cultural, religious and intellectual development of Europe and the West from prehistory to the seventeenth century. FA

HST 104 - Introduction to Western Civilization II: 17th Century to the Present

Credit(s): 3

Covers 17th century absolutism, the Scientific Revolution, the Enlightenment, the French Revolution and Napoleon, the 19th century (liberalism, socialism, nationalism, imperialism), WW I, democracies between the wars, the dictatorships, WW II, and the period since WW II (Cold War, Decolonization). Considers political, social, economic, cultural, religious, and intellectual development of modern Europe and the West since 1648. SP

HST 105 - United States to 1865**Credit(s): 3**

Promotes a better understanding of the multiple origins and development of the United States from the precolonial period through the end of the Civil War, including attention to French, Spanish, and British colonization; the American Revolution; development of the Constitution; the Northwest Ordinances and Louisiana Purchase; slavery and debates over expansion; Indian removal; Jacksonian democracy; the Mexican-American War; and the Civil War. Develops skills of historical thinking through interpretation and analysis of primary and secondary sources. FA

HST 106 - United States History Since 1865**Credit(s): 3**

Traces U.S. history from the Reconstruction period to the present day, exploring questions and issues related to government, technology and transportation, women's roles and rights, race and Civil Rights, immigration, the growth of the consumer economy and mass media, work and labor issues, and war and foreign affairs. Promotes a better understanding of the United States and how it has developed through study of the American past. Covers Reconstruction after the Civil War, Big Business and Reform, the Progressive Era, WW I, the Roaring Twenties, the Depression, WW II, the U.S. since WW II. SP

HST 310 - African-American History**Credit(s): 3**

Provides an introduction to African-American history. Establishes a broad foundation for understanding the influence on America of the African-American community from pre-slavery to contemporary times. Topics include Pre-slavery, Colonialism, The Civil War, Jim Crow Laws, Reconstruction, The Harlem Renaissance, The Civil Rights Movement, and Contemporary Issues. Alternate odd years. SP

HST 314 - Holocaust: Memory, History and Identity**Credit(s): 3**

Holocaust in Memory, History and Identity, studies the Holocaust in the context of that 'most terrible century', the twentieth-century. It seeks to explain why and how genocide became the common vocabulary of the twentieth-century, how memory, myth and myopia transformed the lived experiences of human beings into the lexicon of death, and how suffering and pain were transformed into abstract representation and outright denial. Offered alternate odd years. FA

HST 340 - American Social History**Credit(s): 3**

A study of the history of everyday people in the United States, from the colonial period to the present, with an emphasis on the lives of women and families and on people of color. Topics include food, marriage, family, work, housing, social movements, and emotion. Promotes skills of historical interpretation and historiography through interpretation of primary and secondary sources. FA

HST 366 - Trends That Shaped the Modern World

Credit(s): 3

Study of the major political, economic, intellectual, and social developments which characterize the period from the fall of Napoleon I to the beginning of World War I; focus on "isms:" nationalism, liberalism, industrialism, socialism, and imperialism. Applications in the twentieth century. SP

Fine Arts

ART 155 - Art Appreciation

Credit(s): 3

A study of the vocabulary of art, both in form and meaning. Lecture and studio class structures introduce students to a wide range of art, both historically and culturally significant. Discussion and emphasis is on developing student's visual awareness and sensitivity. Art Appreciation does not satisfy the fine arts art history requirement. FA, SP

ART 160 - Art History Survey I

Credit(s): 3

A survey of Western art and architecture from Paleolithic through Medieval times. FA

ART 260 - Art History Survey II

Credit(s): 3

A survey of Western art and architecture from the Renaissance to the present. SP

MUS 106 - American Popular Music

Credit(s): 3

Social, economic, and musical foundations of ragtime, jazz, swing, and popular music, with a special emphasis on the best work of America's most distinguished popular music composers and lyricists. Some emphasis on the verbal, melodic, harmonic, and rhythmic characteristics that distinguishes the American popular song and its creators. SP

MUS 108 - Music Appreciation

Credit(s): 3

A survey of music for the non-music major. Develops listening skills through exposure to music from a wide variety of historical and cultural styles. Emphasis on the basic elements of music and their psychological impact on the listener, as well as on specific musical forms, media, etc. FA, SP

PER 101 - Theatre Appreciation

Credit(s): 3

An introduction to an awareness and appreciation of the arts of the theatre and to an understanding of the play as a literary form as well as a theatrical experience. Open to all students. FA, SP

PER 102 - Film Appreciation

Credit(s): 3

An introduction to an awareness and appreciation of movies as an art form and to an understanding of film as a literary form as well as a theatrical experience.

PER 314 - Multicultural Experiences in Performance

Credit(s): 3

An examination of various acts of performance as a way of understanding and knowing the human experience. Includes the study of personal narrative, storytelling, folk legends, ritual, ethnography, ethnicity, and an investigation of performance art. Open to all.

Life Science

BIO 106 - Topics in Environmental Science with Lab

Credit(s): 3

An introduction as to how nature works, how the environment has been and is being modified and abused by human activities, and what can be done to protect and improve it for future generations of humans and other living things. FA

BIO 108 - Introduction to Life Science with Lab

Credit(s): 3

Introductory course covering the basic principles of life with an emphasis on the scientific method, characterization of life, organization of living things, energetics, and evolution. FA, SP, SU

BIO 132 - Evolution and Diversity with Lab

Credit(s): 4

A general course in organismal biology covering diversity of living things from the prokaryote to higher plants and animals with an introduction to the principles of evolution. FA

BIO 134 - Cell Biology with Lab

Credit(s): 4

A general course in cellular biology with emphasis on those principles most applicable to all living organisms: cellular organization, energy exchange, and inheritance. SP

BIO 240 - Microbiology for Health Professionals

Credit(s): 3

An introductory course covering the basic principles of life, with an emphasis on and examples from the microbiological world. Content covered will include the scientific method, cellular structure and function, metabolism, genetics, and reproduction in the context of pathology, pathogenicity, and immunology related to health-related microbes. SP

Corequisite(s): BIO 245; Students may not withdraw from BIO 245 unless also withdrawing from BIO 240.

BIO 250 - Microbiology

Credit(s): 3

A general course with emphasis on classification, physiology, and pathology of microorganisms. SP

Prerequisite(s): CHM 106 or CHM 128 (may be taken concurrently); BIO 134 **Corequisite(s):** BIO 245; Students may not withdraw from BIO 245 unless also withdrawing from BIO 250.

Physical Science

CHM 106 - General Chemistry I with Lab

Credit(s): 4

An introductory course in chemistry for science majors. Includes stoichiometry, atomic structure, chemical reactions, and solutions. FA

Prerequisite(s): MTH 105 or MTH 110

CHM 128 - General, Organic, and Biological Chemistry I

Credit(s): 4

An introductory course exploring inorganic principles of chemistry with emphasis on biological contexts. Includes lecture and lab. SP

Prerequisite(s): MTH 105 with minimum grade of C- within last five years or permission of department chair.

PHY 108 - Introduction to Physical Science with Lab

Credit(s): 3

Introductory course in physical science covering the scientific method, basic principles of physics, chemistry, earth science and astronomy. FA, SP, SU

PHY 208 - College Physics I with Lab

Credit(s): 4

An algebra-based course intended for science majors. Includes principles of mechanics, heat, wave motion, and sound with examples and problems taken from biological contexts. FA

Prerequisite(s): MTH 150.

PHY 218 - Engineering Physics I with Lab

Credit(s): 4

A calculus-based course intended for engineering, science and math majors. Includes principles of mechanics, heat, wave motion, and sound. FA (even)

Prerequisite(s): MTH 150.

Writing Intensive

Writing Intensive

Students must take two writing intensive courses: one at the 200-level or above and one at the 300-level or above, which may be embedded in major, minor, or other requirements.

ART 207 - High Art, Propaganda, and Kitsch

Credit(s): 3

Meets the specialized valuing component of the general education requirements. Through the examination of works of

art and artists, students will evaluate the uses of art, both current and historical, to better understand the role it has in contemporary society, and the methods used in critiquing art. FA

ART 260 - Art History Survey II

Credit(s): 3

A survey of Western art and architecture from the Renaissance to the present. SP

ART 393 - Junior Synthesis

Credit(s): 3

Course will deal with essential practical skills for studio artists. The skills will be divided into presentation, documentation, and promotion of the artists' work. Presentation includes matting, mounting, framing, and other considerations for viewing of work, both 2 D and 3D. Documentation will discuss methods, both analog and digital, of documenting artwork, and the purposes of such documentation. Promotion will cover writing about art, resumes, various promotional publications (business cards, brochures, etc.), galleries, competitive shows, graduate schools, and other means of distribution. Combined with the above will be ongoing production and critique of student work in their proposed area of concentration. SP

Prerequisite(s): Junior status.

BIO 203 - Science and Society

Credit(s): 3

An introductory course examining the history of science and technology, with an emphasis on modern science, as well as the philosophy of scientific and technological thought. This course will also explore the reciprocal effects of science on society and society on science. this course has been approved to meet the Writing Intensive General Education Requirement. Annually

BIO 395 - Topics in Healthcare

Credit(s): 3

A capstone course in health, this course will cover current topics in healthcare and allied health professions. This course has been approved to meet the Writing Intensive General Education requirement. FA (odd)

Prerequisite(s): BIO 220, BIO 222, and NTR 216.

BIO 496 - Biology Senior Seminar

Credit(s): 3

A writing-intensive capstone course designed to equip students with the skills of reading and evaluating primary scientific literature, while exploring current topics in science. An oral presentation will be required. This course has been approved to meet the Writing Intensive General Education Requirement. FA

Prerequisite(s): BIO 134 and at least junior status.

CDS 300 - Clinical Methods

Credit(s): 3

The focus of this course is to provide an introduction to theoretical basis for intervention in communication disorders, service delivery models, and general therapy procedures. Emphasis will be placed on specific methods and techniques of intervention, behavior management, and clinical writing. Supervised observation will be included in the course. FA

Prerequisite(s): CDS 105, CDS 211, CDS 220 and major approval.

CDS 496 - Senior Seminar

Credit(s): 3

The focus of this course is the integration and generalization of knowledge in order to help students transition from undergraduate to graduate study. Topics included are: professional issues, setting specific information (legislation, IEP's, Medicaid, Medicare, etc.), communication disorders with special populations. The capstone project is incorporated into this seminar. SP

Prerequisite(s): CDS 300; CDS 302; and a minimum of two of the following: (may be taken concurrently) CDS 311; CDS 380; CDS 420; CDS 425.

CIS 499 - Senior Synthesis

Credit(s): 3

Provides the student with an opportunity to solve an industry-driven, educationally-driven or research problem in their major field of study. The senior synthesis should demonstrate the application and integration of skills, methods and knowledge of earlier coursework to an area that (1) was not covered in the major curriculum or (2) can be further developed from a foundation originating from previous coursework. FA SP

Prerequisite(s): Senior Status and major approval.

COM 350 - Organizational Communication

Credit(s): 3

Students will examine theory and research on organizational communication and consider how they relate to effective practice of communication in organizational settings as well as to the management of issues faced by organizations and workers today. Topics for this course may include organizational culture, group and team dynamics, conflict, leadership, diversity, and technology. FA

COM 495 - Senior Seminar in Communication

Credit(s): 3

In this capstone experience, students design and complete in in-depth research project that has arisen out of their course of study in communication. The study may apply either a social scientific or rhetorical approach to a significant issue in the field of communication. A written paper and public presentation are required. Open only to senior communication studies majors. SP

Prerequisite(s): permission of the instructor.

ECE 232 - The Young Child

Credit(s): 3

Study of the physical, social, emotional, and cognitive development of young children ages three through eight. Course includes observations of preschool age children (30 clock hours in addition to the scheduled class meeting times). SP

Prerequisite(s): ECE 230 or consent of instructor.

ECE 460 - Internship

Credit(s): 7

A supervised, off-campus field-based experience at an approved site specifically related to students' career goals; integrates and applies academic knowledge and skills; emphasizes professional development. FA, SP, SU as needed.

Prerequisite(s): Senior status or consent of instructor.

EDU 263 - Methods of Teaching Reading and Language Arts

Credit(s): 6

Exploration of instructional strategies for communication skills: listening, speaking, reading, and writing. An emphasis on developing creative strategies for oral and written language across the curriculum through theme cycles. Using the literature of children and adolescents, the course explores the teacher's role in the process of developing literacy and students' abilities to construct meaning in the literature-based classroom. FA, SP

Prerequisite(s): EDU 269.

EDU 266 - Methods of Teaching Literacy-Pathways

Credit(s): 6

This course will address the teacher's role in the process of developing student literacy with a particular focus on constructing meaning in the literature-based classroom. The pre-service teacher will develop knowledge of the theories and principles of literacy development for children and adolescents. Teacher candidates will become familiar with child/adolescent literature and develop the strategies and skills to incorporate quality literature into the curriculum. The course will support the development of a knowledge base of current instructional approaches (use of basal reader, skill-based instruction, and literature-based instruction) for the teaching of reading and writing. In addition, the course will identify appropriate strategies and materials which may be used to enhance the teaching of reading, writing, listening, and interpretation of visual representations. Participants will be required to complete 30 hours of observation in a special education classroom and reflect upon those experiences. Offered according to Pathways schedule.

EDU 410 - Planning for Instruction and Assessment

Credit(s): 3

This course will deepen teacher candidate's understanding and utilization of the instructional planning process, including curriculum and standards alignment, critical thinking processes, and problem solving strategies. Focus will include the use of tiered assessment processes and strategies designed to monitor student performance and ensure adequate instructional designs for culturally diverse learners. Additionally, students will review the process and products needed to complete their final assessments for certification. FA, SP

Prerequisite(s): Senior status, major approval, and admission to Teacher Certification

EDU 411 - Clinical Practice for Paraprofessionals -Pathways Only

Credit(s): 3

This final course before field experience provides Pathway students with a review and strengthening of the instructional planning and curriculum design skills which have been imbedded throughout the program. As a clinical experience, students are required to use their assigned classroom as a laboratory to implement course content. The content of the course will include planning and assessment via the Fontbonne lesson planning model. Differentiated instruction will be introduced conceptually and utilized practically as a means to address the needs of diverse learners. Response to Intervention and a deeper understanding of the entire IEP process is included. The relationship of these skills to classroom, school, and district curriculum alignment will be stressed. In addition, the students will address the instructional processes and products needed to complete their final assessment for certification. Offered per Pathways schedule.

EDU 447 - Planning for Instruction and Assessment-Middle and Secondary

Credit(s): 3

This course will provide the skills and knowledge to teacher certification candidates in middle school and high school which will deepen their understanding and utilization of the instructional planning process and the importance of curriculum alignment. The course will build upon and strengthen the skills and knowledge related to instructional

planning and assessment acquired through the various certification courses the students have taken previously. The content of the course will include a solid foundation in curriculum alignment which includes planning and assessment via Fontbonne's lesson planning model. In addition, the students will address the instructional process and products needed to complete their Final assessment for certification. FA, SP Background Check Required

Prerequisite(s): Admission to teacher certification candidacy.

ENG 200 - Introduction to English

Credit(s): 3

Serves as introduction to the purposes and scope of the majors in literary studies, English for secondary certification, and professional writing. Provides majors with a foundation in the concepts and methods necessary for further study in the field. Includes introduction to specific research resources and consideration of career options. Even FA

ENG 201 - Business Writing

Credit(s): 3

The theory behind the practice of various forms of business writing-letters, memos, proposals and reports. Emphasis on formulating communication objectives, analyzing the audience, structuring the message, and adopting an appropriate style. Individualized projects allow students to adapt the course to their own needs. FA, SP

Prerequisite(s): ENG 101 or equivalent.

ENG 203 - Writing for Social Justice

Credit(s): 3

Explores the role of rhetoric and written communication in social justice activism, as conceptualized from Catholic social teaching. Students will learn to analyze public rhetorical situations surrounding social justice issues and to employ effective rhetorical strategies in the production of common public genres, both print and digital, such as opinion-editorials, letters to editors, videos, white papers, letters to congress, manifestos, etc. in support of social justice causes. The course may include a community engagement component requiring students to work with a community social justice organization. SP Even

ENG 304 - Creative Nonfiction

Credit(s): 3

Advanced work in expository writing; detailed analysis of prose models with The New Yorker as text; extensive development of subject matter and in-depth consideration of style. Odd FA

Prerequisite(s): ENG 101 or ENG 102 or equivalent or permission of the instructor.

ENG 311 - Writing Poetry

Credit(s): 3

Study of poetic theory; introduction to creative techniques through analysis of selections of modern and contemporary poetry; writing poetry in various narrative and lyrical forms. Even FA

Prerequisite(s): ENG 101 or ENG 102 or equivalent or permission of the instructor.

ENG 312 - Writing Short Fiction

Credit(s): 3

In-depth study of the short story form through analysis of selections from modern fiction; introduction to creative techniques and practices; development of two original short stories. Even SP

Prerequisite(s): ENG 101 or ENG 102 or equivalent or permission of the instructor.

ENG 313 - Writing the One-Act Play

Credit(s): 3

Through writing exercises and analysis of modern one-act plays, students explore the most effective ways to tell stories through dramatic form; construction of short scenes and one original play. Offered as interest warrants.

Prerequisite(s): ENG 101 or ENG 102 or equivalent or permission of the instructor.

ENG 496 - Senior Thesis

Credit(s): 3

Advanced study in literary research or writing. Allows the student to develop in depth an interest that has arisen during his or her course of major study, to apply skills developed, and to demonstrate preparation for advanced study or professional practice. Coursework may be done independently or in conjunction with another, relevant course (with departmental permission). FA, SP

Prerequisite(s): Senior literary studies, professional writing, or English for secondary certification major.

FAS 307 - Fashion Behavior and Forecasting

Credit(s): 3

Social, psychological, economic, political, and communication factors influencing consumers' fashion preferences and buying decisions are studied. Principles and methods used to forecast fashion trends are analyzed. SP

Prerequisite(s): FAS 107; MKT 210; or consent of instructor.

FCS 340 - Family Resource Management and Relations

Credit(s): 3

Study of the availability of resources to individuals and families. Stresses management processes necessary for the satisfaction of needs and achievement of goals. Focus is on family dynamics and the relationships of family with social institutions. Additional service learning hours are required beyond the scheduled class meeting times. This course has been designated as a service learning course by the university. FA, SP

FCS 485 - Public Policy and Advocacy in FCS

Credit(s): 3

Critical examination of current family and consumer sciences public policy initiatives and the role of professional advocacy. Students will explore strategies to promote individual well-being, family strengths, and community vitality. Students will develop and execute public policy or regulatory advocacy plans that seek to empower others. This course is designated as WI by the university. FA SP

Prerequisite(s): FCS 340

FDS 424 - Experimental Foods/Lab

Credit(s): 3

Introduction to research and scientific methods of problem solving in the area of foods. Emphasis on student directed projects and experiments using research and development techniques, appropriate technology, and oral and written communication of research findings. Laboratory experience. This course has been designated as writing intensive by the university. FA

Prerequisite(s): FDS 221 and PSY 330.

HCM 310 - Ethics in Healthcare

Credit(s): 3

This course will provide a foundation of ethical theory, which students will apply to decision making in a healthcare environment. Students will discuss contemporary moral issues in a healthcare context and learn to analyze problems using classical ethics theories. Offered on an as-needed basis.

HST 366 - Trends That Shaped the Modern World**Credit(s): 3**

Study of the major political, economic, intellectual, and social developments which characterize the period from the fall of Napoleon I to the beginning of World War I; focus on "isms:" nationalism, liberalism, industrialism, socialism, and imperialism. Applications in the twentieth century. SP

MGT 330 - Management and Business Ethics**Credit(s): 3**

A study of the process and criteria for forming and testing values and relating them to ethical obligations. Personal values are examined in relation to organizational values. Ethical systems are studied and applied to organizational and public policy issues. FA, SP

MGT 460 - Strategic Management**Credit(s): 3**

This is a capstone course that synthesizes all of the business administration functions using the case study applications process and methodology. Cases in general management require the application of knowledge, theories, skills and techniques derived from previous coursework in order to provide analyses of specific business problems and for decision making to formulate strategies, plans, and policies for the improvement of organizational performance. This is designated as a writing intensive course. FA, SP, SU

Prerequisite(s): Senior status.

MTH 499 - Senior Synthesis**Credit(s): 3**

Provides the student with an opportunity to solve an industry-driven, educationally-driven or research problem in their major field of study. The senior synthesis should demonstrate the application and integration of skills, methods and knowledge of earlier coursework to an area that (1) was not covered in the major curriculum or (2) can be further developed from a foundation originating from previous coursework. FA SP

Prerequisite(s): Senior Status and major approval.

PER 443 - Text Analysis**Credit(s): 3**

Concentrates on the study of texts from the modern era (Ibsen) and continuing through contemporary drama. Texts will be analyzed to assist either teacher, director, or actor in making informed and effective choices when seeing plays performed or working in any capacity on a performance.

PHL 221 - Business Ethics**Credit(s): 3**

A systematic overview of normative ethics and a comprehensive discussion of contemporary moral issues in a business context. Employs actual case studies drawn from business, as well as readings from a wide range of thinkers. FA, SP

PHL 260 - Contemporary Moral Issues

Credit(s): 3

An introduction to ethical theories and their application to a wide range of issues, e.g., sexuality, abortion, capital punishment, affirmative action, euthanasia. FA, SP

PSY 330 - Research Methods for the Behavioral Sciences

Credit(s): 3

An introduction to basic techniques and research methods used in the social sciences. Emphasis is on learning the application of research methodology and on the analysis, interpretation, and presentation of results. Topics include observational, correlational, experimental, and quasi-experimental designs. This course has been designated as meeting a writing intensive course requirement in Fontbonne's General Education core. FA, SP

Prerequisite(s): PSY 100.

PSY 391 - Testing and Measurement for the Behavioral Sciences

Credit(s): 3

Provides an overview of principles of psychological testing and measurement as related to aptitudes, attitudes, and personality. Examines theories of psychological testing, the nature and types of psychological tests, test construction, test administration, interpretation of scores, ethical issues in testing, scale construction, and basic psychometric theory. Special emphasis on reliability, validity, and standardization procedures. This course has been designated as meeting a writing intensive course requirement in Fontbonne's General Education core. SP (Even Years)

Prerequisite(s): PSY 100; PSY 320; junior or senior status.

PSY 496 - Senior Research Seminar I

Credit(s): 3

First semester of the capstone experience for psychology seniors planning to apply to graduate programs. Students will plan, research, and design an independent empirical research study in a particular area of psychology. Research proposals will be submitted to the University's IRB and will be summarized in an APA-format paper at the end of the semester. In addition, students will prepare for graduate study or careers in psychology. This course is the first semester of a year-long capstone experience. FA

Prerequisite(s): PSY 100; PSY 320 or PSY 330; At least a 3.0 overall cumulative GPA and at least a B- in all required Psychology courses or consent of instructor.

SOC 345 - Sociological Research Methods

Credit(s): 3

An introduction to the theory and practice of methodology used in social research, including research design, field research, conceptualization, and ethical issues. Emphasis is on the application of research methods. FA.

Prerequisite(s): PSY 100, SOC 100; MTH 115 or PSY 320 recommended.

SPT 330 - Leadership and Governance in Sports

Credit(s): 3

This course places an emphasis on the introduction to management theory and how it can guide practical applications in sports industries. The course will address management philosophy, management tasks, responsibilities, organization structures, leadership, motivational techniques, decision making, and factors that influence governance, such as environmental influences, power and politics. The student will be responsible for engaging in an in-depth look at various sports governing bodies, which include such organizations as the International Olympic Committee, Arena

Network, and the National Collegiate Athletic Association. FA

Prerequisite(s): SPT 101.

SWK 351 - Generalist Practice III: Communities, Groups, and Organizations

Credit(s): 3

This is the third course in the practice methods sequence, and includes comprehensive focus on knowledge, values, and skills of generalist practice with groups, organizations, and communities. The Planned Change Steps Model: engagement, assessment, planning, implementation, evaluation, termination, and follow up will be used for in-depth study of human behavior in the macro social environment, including group, community, and organizational theories and dynamics. Developing and managing agency resources, advocacy, and social action with populations at risk, ethical dilemmas in macro practice, working with the courts, stress, and time management will be included. FA,SP

SWK 370 - Research and Social Work Practice

Credit(s): 3

This course focuses on the foundation content in research and evaluation methods and designs that may be utilized by generalist practice social workers to evaluate practice and programs as well as advancing practice knowledge. The course will give attention to students developing understanding of the ethics of social work research and evaluation, and the special issues in conducting research and evaluations with culturally diverse and at risk populations. Students will become familiar with basic research and evaluation concepts and methodology. FA,SP

Prerequisite(s): MTH 115.

College of Arts and Sciences

Dr. Adam G. Weyhaupt, Dean

Undergraduate Certificate

Cybersecurity Certificate

The certificate provides a solid foundation in cybersecurity and is designed for someone who has knowledge of a programming language but with little background in cybersecurity.

Courses Required for the Certificate (12 credits)

Level 1 Certificate (12 credits)

Designed for a person with 2 or more years of experience in the IT field with little or no experience in cybersecurity.

CIS 125 - Introduction to Cybersecurity and Cyber Crime and Policies

Credit(s): 3

Introduces students to the fields of cybercrime and security. Employs the cross-cutting concepts of confidentiality, integrity, authentication, and availability to model the security properties of a system. Covers issues associated with different types of controls employed to defend against threats and attacks that exploit vulnerabilities in the system. The course also covers cybercrime laws, quantitative and qualitative risk assessment and implementation of security

policies. Practical cryptography, establishing identity, physical and organizational security, security of operating systems, computer networks, applications and other types of computer systems will also be introduced. SP.

Prerequisite(s)/Corequisite(s): MTH 115.

Plus three additional 300 or 400-level cybersecurity major CIS courses, one of which may be a general computer science course that is a prerequisite or co-requisite for a specific cybersecurity course.

Level 2 Certificate (12 credits)

Designed for a person with 2 or more years of experience in the IT field with some experience in cybersecurity.

Four 300 or 400-level cybersecurity major CIS courses, one of which may be a general computer science course that is a prerequisite or co-requisite for a specific cybersecurity course.

Web Development and Design Certificate

This certificate provides a solid foundation in all aspects of website development: graphics design, programming, and installation. See certificate program in the undergraduate academic policy and regulations section of this catalog.

Courses Required for the Certificate (23 credits)

ART 202 - Intro to Web Design

Credit(s): 3

This foundation course focuses on the core components of web design: HTML, Cascading Style Sheets, and JavaScript. Site design and organization, user interaction, accessibility issues will be discussed and applied.

ART 223 - Introduction to Graphic Design

Credit(s): 3

This course introduces design elements and principles. Focus will be on composition, typography, color, and imaging, for a variety of media including print and electronic media. Students will explore communicating information through a variety of media

ART 302 - Web Design II

Credit(s): 3

Expanding from the introductory course (ART202), the course will focus on delivering content using responsive (device-independent) techniques. Topics will include client- and server-side scripting, advanced use of CSS, building and using forms, and user interaction.

Prerequisite(s): ART 202

CIS 160 - Computer Science I

Credit(s): 4

Emphasis on programming in C and introduction to C++, including structural programming concepts, simple data types and structures, C and C++ syntax, operators, control structures secure coding skills. Lab exercises include techniques of coding, program design, and debugging. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information science must earn grades of B- or better in this course to progress to CIS 161 and/or CIS 210. FA

Prerequisite(s): Grade of B or better in MTH 095 or competency in arithmetic and algebra. For CS, Cybersecurity or MIS majors, CIS 120 is a pre- or co-requisite.

CIS 161 - Computer Science II

Credit(s): 4

Continuation of Computer Science I, with extensive programming in C++ language and introduction to Java. Includes secure coding skills, string handling, file I/O, storage and static variables, structures, bitwise operations, and C++ library. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information systems must earn grades of B- or better to progress to CIS 210 and above. SP

Prerequisite(s): CIS 120 and CIS 160.

CIS 215 - Database Fundamentals and Web Server Programming

Credit(s): 3

An introduction to server technology, database fundamentals and web server programming. Topics include system architecture, file servers, FTP servers, web servers, database servers with an emphasis on server installation and configuration as well as table design and management, creating and using queries and writing programs on the server to support a web site. FA Odd.

Prerequisite(s): CIS 160 and CIS 161.

CIS 315 - Advanced Server-side Programming

Credit(s): 3

This course teaches the advanced techniques of server-side programming over the Internet. Topics include using session control, accessing back-end database servers, E-commerce security issues, interacting with file systems, implementing secure transactions, and using network and protocol functions. SP

Prerequisite(s): CIS 215.

Undergraduate Major

Applied Behavioral Sciences, B.A.

The Applied Behavioral Sciences (ABS) major provides students with fundamental courses in psychology as well as specific courses in related disciplines that fit with the student's interests and career aspirations. Students learn research and writing skills through courses in statistics and research methods, and the major culminates with a portfolio project in which the student creates an artifact that integrates and summarizes the information and skills he or she learned throughout the program.

Students enrich their understanding of the applied nature of the behavioral sciences by selecting additional electives from related disciplines, such as education, early childhood, communications, business, the health sciences, or social work. These electives are selected with help from the student's advisor in order to maximize the student's preparedness for the particular occupations the student wishes to pursue upon graduation.

The major consists of 36 credit hours of required courses. Many of the courses can be completed in evening or online formats. Students must have a minimum cumulative grade point average (GPA) of 2.3 on a 4.0 scale from all colleges/universities attended as well as a GPA of a 2.5 in major courses for acceptance into the major, to remain in the program, and for graduation. All courses for the major must be completed with grades of C- or above.

Baccalaureate Degree and Residency Requirements

All requirements for an undergraduate degree are listed under academic policies and regulations in the introductory section for undergraduate programs in this catalog. These requirements include a graduation requirement of at least one course in religion or theology.

General Education Requirements

The 42 credit hours of general education requirements are presented in the academic information section in this catalog. A course that meets a general education requirement may also meet a course requirement in the major or a course requirement in another discipline.

Courses Required for the Applied Behavioral Sciences Major

PSY 100 - Introduction to Psychology

Credit(s): 3

A general introduction to the discipline of psychology. The course examines the historical and theoretical foundations of modern psychology and surveys the various topical areas that use scientific methodology to study and explain human behavior and mental processes. Topics considered include biological foundations, sensation and perception, motivation and emotion, human development, personality, social psychology, psychological disorders, and therapy. FA, SP, SU, Online

SOC 100 - Survey of Sociology

Credit(s): 3

An examination of the definition, scope, and basic concepts of sociology; scientific approach to the study of society; practical application of concepts learned. FA, SP, Online

PSY 200 - Developmental Psychology

Credit(s): 3

A study of the nature of human development across the life span. The course covers the physical, cognitive, and psychosocial development of the individual for each of the major developmental periods: infancy, childhood, adolescence, and adulthood. The psychosocial experience of aging and death is also examined. FA, SP, SU, Online

PSY 315 - Abnormal Psychology

Credit(s): 3

The course examines the nature and scope of psychological maladjustment and pathology. Particular emphasis is given to the classification, description, and treatment of mental disorders, as well as their effects for the person, family, and society. Course focuses on a broad range of psychopathology, including anxiety disorders, depression and suicide, eating disorders, schizophrenia, dissociative disorders, and personality disorders. FA (odd years)

Prerequisite(s): PSY 100.

PSY 310 - Social Psychology

Credit(s): 3

Cross-listed with: SOC 310.

An examination of human social behavior. Primary focus is on the behavior of individuals in social contexts. The course examines scientific theories and research on the ways people think about, influence, and relate to one another. Topics include attribution theory, attitudes, persuasion, conformity, prejudice, aggression, and altruism. SP (Even Years)

Prerequisite(s): PSY 100 or SOC 100.

OR

SOC 310 - Social Psychology

Credit(s): 3

Cross-listed with: PSY 310.

An examination of human social behavior. Primary focus is on the behavior of individuals in social contexts. The course examines scientific theories and research on the ways people think about, influence, and relate to one another. Topics include attribution theory, attitudes, persuasion, conformity, prejudice, aggression, and altruism. SP (Even years)

Prerequisite(s): SOC 100 or PSY 100.

ABS 496 - Portfolio Project in the Applied Behavioral Sciences

Credit(s): 3

Cross-listed with: PSY 301: Careers in Psychology.

This course is generally taken the student's senior year in the ABS major. Students will create a portfolio of materials that synthesizes their experiences in the ABS program and demonstrates their expertise in their chosen field of interest. FA

Prerequisite(s): Prior acceptance into the ABS program; junior or senior status.

One of the Following Courses (3 credits)

MTH 115 - Introduction to Statistics

Credit(s): 3

Topics covered: descriptive statistics, probability, binomial, chi-squared and normal probability distributions, tests of hypotheses, linear correlation and regression, and analysis of variance. FA, SP, SU

Prerequisite(s): Grades of C- or better in MTH 095 or competency in arithmetic and algebra.

OR

PSY 320 - Statistics for Scientists

Credit(s): 3

An introduction to statistics and statistical analysis in sciences. The course examines both descriptive and inferential statistical methods. Emphasis is on the use of statistical analysis in scientific research. Topics covered include frequency, distributions, percentiles, standardized scores, probability theory, sampling distributions, t-tests, correlation, and ANOVA. FA

One of the Following Courses (3 credits)

PSY 330 - Research Methods for the Behavioral Sciences

Credit(s): 3

An introduction to basic techniques and research methods used in the social sciences. Emphasis is on learning the application of research methodology and on the analysis, interpretation, and presentation of results. Topics include observational, correlational, experimental, and quasi-experimental designs. This course has been designated as meeting a writing intensive course requirement in Fontbonne's General Education core. FA, SP

Prerequisite(s): PSY 100.

OR

PSY 391 - Testing and Measurement for the Behavioral Sciences

Credit(s): 3

Provides an overview of principles of psychological testing and measurement as related to aptitudes, attitudes, and personality. Examines theories of psychological testing, the nature and types of psychological tests, test construction, test administration, interpretation of scores, ethical issues in testing, scale construction, and basic psychometric theory. Special emphasis on reliability, validity, and standardization procedures. This course has been designated as meeting a writing intensive course requirement in Fontbonne's General Education core. SP (Even Years)

Prerequisite(s): PSY 100; PSY 320; junior or senior status.

Courses Required in Other Disciplines

Required courses may not be taken independently.

SOC 100 - Survey of Sociology

Credit(s): 3

An examination of the definition, scope, and basic concepts of sociology; scientific approach to the study of society; practical application of concepts learned. FA, SP, Online

Elective Courses

Applied Behavioral Sciences majors must also complete 12 credits of elective courses. At least 6 credits of these elective courses must have a PSY prefix (see the above list of PSY electives) and must be at the 300 or 400 level. The remaining 6 credits will consist of electives chosen based on the student's academic and professional interests, in consultation with the student's academic advisor.

Additional Requirements

The field of applied behavioral sciences involves working closely with people and social organizations. In keeping with the guidelines of the discipline and the mission of Fontbonne University, all students enrolled in the major are required to act ethically and to treat *all others* with respect and dignity.

Failure to meet this requirement may lead to dismissal from the major at any time.

Applied Mathematics, B.S.

This major exposes students to various areas of applied mathematics, including mathematical modeling, data analytics, and statistics. Computer programming and software application areas are also included in this major. Internships are available as MTH 284 and MTH 484, but are not required.

Baccalaureate Degree and Residency Requirements

All requirements for an undergraduate degree are listed under Academic Policies and Regulations in the undergraduate introductory section in this catalog. These requirements include a graduation requirement of at least one course in religion or theology.

General Education Requirements

The 42 credit hours of general education requirements are presented in the Academic Information section of this catalog. A course that meets a general education requirement may also meet a course requirement in the major or a course requirement in another discipline.

Courses Required for the Major

MTH 120 - Discrete Mathematics

Credit(s): 3

Topics include: truth tables, propositional logic, sets, binary and equivalence relations, functions, matrices, binary, octal and hexadecimal number systems, combinatorics, proof by induction and recursion, and algorithms. FA

Prerequisite(s): Competency in arithmetic and algebra.

MTH 150 - Calculus with Analytic Geometry I

Credit(s): 4

Differential and integral calculus of the algebraic and transcendental functions associated with analytic geometry. SP

Prerequisite(s): Three years of high school mathematics including trigonometry with grades of B or better, or MTH 110 (with a grade of C- or better), or (MTH 105 and MTH 108) with grades of C- or better, or the consent of the instructor.

MTH 151 - Calculus with Analytic Geometry II

Credit(s): 4

A continuation of MTH 150, continuation of differential and integral calculus; infinite series. FA

Prerequisite(s): MTH 150 with grades of C- or better.

MTH 200 - Linear Algebra

Credit(s): 3

Topics include: vector spaces, linear transformations, and matrices. FA

Prerequisite(s)/Corequisite(s): Pre- or co-requisite: MTH 151.

MTH 250 - Calculus with Analytic Geometry III

Credit(s): 4

Vector calculus, the differential, multivariate calculus with applications. SP

Prerequisite(s): MTH 151.

MTH 288 - Portfolio A

Credit(s): 0

Portfolio A requires the student to submit artifacts from three specific courses required for the majors in Applied Mathematics and Mathematics for Secondary Education, along with other specified items. The specific courses are listed in the current catalog. Successful submission of Portfolio A as well as a minimum GPA of 2.5 are both required for major approval. FA, SP, SU

MTH 310 - Differential Equations

Credit(s): 3

Techniques for solving ordinary differential equations. Investigation of existence and uniqueness of solutions; a variety of applications. SP (Odd)

Prerequisite(s): MTH 151.

MTH 430 - Algebraic Structures

Credit(s): 3

Covers algebraic structures including Boolean algebra, groups, rings, integral domains and fields and their applications which may include: cryptography, coding theory, color patterns, and switching circuits. SP (Even)

Prerequisite(s): MTH 120 and MTH 150.

MTH 498 - Senior Portfolio

Credit(s): 1

Provides students with the opportunity to create and submit their final portfolio, which is required for graduation. Some of the items in the portfolio are: (1) a self-assessment in relation to how well the student outcomes for program were attained, (2) statements about the professional, ethical, legal, social and security issues and responsibilities associated with the chosen field of study, (3) statements about plans for future professional growth and (4) a professional resume. FA SP

Prerequisite(s): MTH 288, Senior status and major approval.

MTH 499 - Senior Synthesis

Credit(s): 3

Provides the student with an opportunity to solve an industry-driven, educationally-driven or research problem in their major field of study. The senior synthesis should demonstrate the application and integration of skills, methods and knowledge of earlier coursework to an area that (1) was not covered in the major curriculum or (2) can be further developed from a foundation originating from previous coursework. FA SP

Prerequisite(s): Senior Status and major approval.

One of the Following Two Courses (3 credits)

MTH 115 - Introduction to Statistics

Credit(s): 3

Topics covered: descriptive statistics, probability, binomial, chi-squared and normal probability distributions, tests of hypotheses, linear correlation and regression, and analysis of variance. FA, SP, SU

Prerequisite(s): Grades of C- or better in MTH 095 or competency in arithmetic and algebra.

MTH 125 - Biostatistics**Credit(s): 3**

Introduces the application of statistical concepts to biological problems over a broad range of fields including biological sciences, medicine and public health. The evaluation of experimental design in biological studies will be addressed. Topics covered include: scientific method, data representation, descriptive statistics, inferential statistics and data analysis, normal probability distributions, estimation and hypotheses testing, chi-squared distributions and the analysis of variance. An appropriate statistical program (currently R) will be used as a tool in the course. FA

Prerequisite(s): MTH 105 or MTH 110 (or equivalent knowledge) and BIO 134 or an introductory biology course (can be concurrent).

Three of the Following Five Courses (9 credits)**MTH 300 - Modeling and Numerical Approximation****Credit(s): 3**

Principles of model construction with selected case studies from various fields. Also, techniques of numerical approximation. SP (Odd)

Prerequisite(s): MTH 150 and CIS 160.

MTH 315 - Advanced Statistics**Credit(s): 3**

Covers widely used statistical tools such as linear and nonlinear regression, analysis of variance, expected mean squares and pooling. Students will use a statistical package to analyze data sets. FA (Even)

Prerequisite(s): (MTH 115 or MTH 125) and MTH 150 or consent of instructor.

MTH 316 - Non-Parametric Statistics**Credit(s): 3**

An introduction to nonparametric statistical procedures. Topics include order statistics, rank order statistics and scores, tests of goodness of fit, linear rank tests for location and scale problems, applications. FA (Odd)

Prerequisite(s): MTH 115.

MTH 325 - Theory and Applications of Probability**Credit(s): 3**

Introduces the mathematical treatment of random phenomena occurring in the natural, physical, and social sciences. Topics include combinatorial analysis, binomial distribution, Poisson and normal approximation, random variables and probability distributions, generating functions, Markov chains applications. SP (odd)

Prerequisite(s): MTH 115 or MTH 125 and MTH 150.

MTH 405 - Principles of Cryptography

Credit(s): 3

Cross-listed with: MTH 405 is cross-listed with CIS 535. To distinguish MTH 405 from CIS 535 additional or differentiated assignments and/or assessments appropriate to the graduate level will be assigned.

Introduces the fundamentals of cryptography including the concept of obscuring functions, cryptographic techniques, types of ciphers, proper uses of ciphers, ethical uses of cryptography and decryption practices. Topics also include randomness, polymorphism and current trends in cryptography. Students will learn how to use cryptographic techniques to master the cross-cutting cybersecurity concepts of confidentiality and integrity in system design. They will also learn how to think like an adversary when analyzing the strengths and weaknesses of cryptographic algorithms. FA (Even).

Prerequisite(s): MTH 120.

Courses Required in Other Disciplines

An application area may be selected from any of the following: accounting, business, biology, chemistry, computer science, cybersecurity, data analytics, education, finance, general science, or web development and design. Details for each application area follow.

Accounting Application Area (25 credits)

ACT 210 - Financial Accounting

Credit(s): 3

Acquaints students with the language of communicating financial information of a business enterprise to owners and stakeholders. Material to be covered includes the components of financial statements and the development thereof, accounting principles of service and merchandising concerns, and inventory and depreciation methods. FA, SP, SU

Prerequisite(s): BSA 100 (may be taken concurrently).

ACT 220 - Managerial Accounting

Credit(s): 3

Focuses on developing and utilizing accounting information for planning, control, and managerial decision making. Cost classifications, job costing, process costing, activity-based costing, cost-volume profit analysis, budgeting, variable costing, relevant cost, and the contribution approach to decision making will be covered. FA, SP, SU

Prerequisite(s): ACT 210.

ACT 310 - Intermediate Accounting I

Credit(s): 3

A study of the body of generally accepted accounting principles specifically concerned with the recognition of matching of revenues and expenses to determine book net income and the related issues of asset measurement, including modifications and refinements used to develop accounting information. FA

Prerequisite(s): ACT 210.

ACT 320 - Intermediate Accounting II

Credit(s): 3

A study of generally accepted accounting principles focusing on the problems of balance sheet valuation and the effect upon the income statement and the statement of cash flows. Recent accounting standards affecting judgment and opinion upon financial statements are also considered. SP

Prerequisite(s): ACT 310.

ACT 420 - Accounting Information Systems

Credit(s): 3

A study of the flow of accounting information systems with other information systems. The course integrates student knowledge of financial accounting and cost accounting with computerized information systems. Special emphasis will be given to the analysis, design, and auditing of computerized accounting information systems. SP, SU

Prerequisite(s): ACT 320.

CIS 110 - Computer Applications: Spreadsheet

Credit(s): 3

Covers capabilities of Windows-based spreadsheet software. Presents spreadsheet terminology, basic commands, and features for data formatting, calculation, and creating tables and charts. Additional topics include building applications for data referencing, analysis and reports, advanced functions, and macros. Course will include development of a significant spreadsheet project by the student. FA, SP

CIS 160 - Computer Science I

Credit(s): 4

Emphasis on programming in C and introduction to C++, including structural programming concepts, simple data types and structures, C and C++ syntax, operators, control structures secure coding skills. Lab exercises include techniques of coding, program design, and debugging. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information science must earn grades of B- or better in this course to progress to CIS 161 and/or CIS 210. FA

Prerequisite(s): Grade of B or better in MTH 095 or competency in arithmetic and algebra. For CS, Cybersecurity or MIS majors, CIS 120 is a pre- or co-requisite.

ACT 350 - Income Taxation for Individuals

Credit(s): 3

The study of the Internal Revenue Code and concomitant regulations as they relate to the accounting problems affecting individual and corporate taxpayers. Course will deal with both the theoretical and practical (compliance) aspects of tax accounting, including the regular and alternative minimum tax computations. FA

Prerequisite(s): ACT 210.

OR

ACT 430 - Advanced Financial Management

Credit(s): 3

An advanced topics course that builds upon the principles covered in Managerial Finance. Emphasis is on the decision-making processes followed by corporate financial managers. Topics include the time value of money, capital budgeting, risk evaluation, dividend policy, capital markets, evaluation of investment alternatives and derivative securities. Topics will be examined from both domestic and international perspectives. SP

Prerequisite(s): ACT 220; FIN 310.

Biology Application Area (25-26 credits)

BIO 132 - Evolution and Diversity with Lab

Credit(s): 4

A general course in organismal biology covering diversity of living things from the prokaryote to higher plants and animals with an introduction to the principles of evolution. FA

BIO 134 - Cell Biology with Lab**Credit(s): 4**

A general course in cellular biology with emphasis on those principles most applicable to all living organisms: cellular organization, energy exchange, and inheritance. SP

BIO 212 - Genetics**Credit(s): 3**

Study of the fundamental laws of inheritance in biological systems. FA

Prerequisite(s): BIO 134

BIO 318 - Advanced Cellular Biology**Credit(s): 3**

Study of fine structures, metabolism, physical, and chemical activities of cells and subcellular structures. FA (odd years)

Prerequisite(s): BIO 134

CIS 160 - Computer Science I**Credit(s): 4**

Emphasis on programming in C and introduction to C++, including structural programming concepts, simple data types and structures, C and C++ syntax, operators, control structures secure coding skills. Lab exercises include techniques of coding, program design, and debugging. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information science must earn grades of B- or better in this course to progress to CIS 161 and/or CIS 210. FA

Prerequisite(s): Grade of B or better in MTH 095 or competency in arithmetic and algebra. For CS, Cybersecurity or MIS majors, CIS 120 is a pre- or co-requisite.

CIS 161 - Computer Science II**Credit(s): 4**

Continuation of Computer Science I, with extensive programming in C++ language and introduction to Java. Includes secure coding skills, string handling, file I/O, storage and static variables, structures, bitwise operations, and C++ library. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information systems must earn grades of B- or better to progress to CIS 210 and above. SP

Prerequisite(s): CIS 120 and CIS 160.

CIS 200 - Scientific Computing Languages**Credit(s): 3**

Covers an introduction to scripting languages and their applications to scientific data (currently Python programming language and the R-statistical analysis program will be taught). SP

Prerequisite(s): (MTH 125 or MTH 115)

OR

CIS 210 - Object-Oriented Programming (Java)

Credit(s): 4

Introduction to concepts of abstract data type and inheritance. Topics include the fundamentals of object-oriented program design, secure coding skills, object-oriented programming using Java. Lab exercises include introductory to intermediate level software analysis and design. FA

Prerequisite(s): CIS 161.

Business Application Area (26 credits)

ECN 210 - Principles of Macro Economics

Credit(s): 3

Macroeconomics is concerned with keeping economic fluctuations within reasonable bounds. Topics include the measurement of the national income, inflation, unemployment, economic growth and monetary and fiscal policies and international outcomes. FA, SP, SU

Prerequisite(s): BSA 100 (may be taken concurrently).

ECN 220 - Principles of Micro Economics

Credit(s): 3

Microeconomics, or the theory of the firm, explains price determination and resource allocation. Topics include the supply/demand model, elasticity, the theory of consumer behavior, the theory of production and cost of production, and an examination of various market structures. FA, SP, SU

Prerequisite(s): BSA 100 (may be taken concurrently).

ACT 210 - Financial Accounting

Credit(s): 3

Acquaints students with the language of communicating financial information of a business enterprise to owners and stakeholders. Material to be covered includes the components of financial statements and the development thereof, accounting principles of service and merchandising concerns, and inventory and depreciation methods. FA, SP, SU

Prerequisite(s): BSA 100 (may be taken concurrently).

ACT 220 - Managerial Accounting

Credit(s): 3

Focuses on developing and utilizing accounting information for planning, control, and managerial decision making. Cost classifications, job costing, process costing, activity-based costing, cost-volume profit analysis, budgeting, variable costing, relevant cost, and the contribution approach to decision making will be covered. FA, SP, SU

Prerequisite(s): ACT 210.

FIN 310 - Managerial Finance

Credit(s): 3

A study of finance as a managerial tool; particular emphasis will be given to the time value of money, stock and bond pricing, working capital management and capital budgeting. FA, SP, SU

Prerequisite(s): ACT 210.

CIS 160 - Computer Science I

Credit(s): 4

Emphasis on programming in C and introduction to C++, including structural programming concepts, simple data types and structures, C and C++ syntax, operators, control structures secure coding skills. Lab exercises include techniques of coding, program design, and debugging. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information science must earn grades of B- or better in this course to progress to CIS 161 and/or CIS 210. FA

Prerequisite(s): Grade of B or better in MTH 095 or competency in arithmetic and algebra. For CS, Cybersecurity or MIS majors, CIS 120 is a pre- or co-requisite.

CIS 161 - Computer Science II**Credit(s): 4**

Continuation of Computer Science I, with extensive programming in C++ language and introduction to Java. Includes secure coding skills, string handling, file I/O, storage and static variables, structures, bitwise operations, and C++ library. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information systems must earn grades of B- or better to progress to CIS 210 and above. SP

Prerequisite(s): CIS 120 and CIS 160.

CIS 330 - Database Management Systems**Credit(s): 3**

Provide comprehensive data management and integrity, database design and evaluation, query design and evaluation, and web interfacing. Students will learn all the steps from data modeling (ER diagrams) to table generation and linking to accessing and querying using SQL to enhance data availability. FA

Prerequisite(s): CIS 161.

Chemistry Application Area (32-33 credits)

The chemistry application area contains the requirements for the chemistry minor as it is defined in the department of biological and physical sciences section of this catalog.

CHM 106 - General Chemistry I with Lab**Credit(s): 4**

An introductory course in chemistry for science majors. Includes stoichiometry, atomic structure, chemical reactions, and solutions. FA

Prerequisite(s): MTH 105 or MTH 110

CHM 108 - General Chemistry II with Lab**Credit(s): 4**

A continuation of CHM 106; includes kinetics, equilibrium, thermodynamics, acids and bases, and electrochemistry. SP

Prerequisite(s): CHM 106.

CHM 210 - Organic Chemistry I**Credit(s): 3**

A study of the compounds of carbon with emphasis on functional groups, structure nomenclature, and reactions. FA

Prerequisite(s): CHM 106; CHM 108.

CHM 211 - Organic Chemistry I Lab

Credit(s): 2

Laboratory experience to accompany CHM 210. SP

Prerequisite(s): CHM 106, CHM 108, and CHM 210

CHM 212 - Organic Chemistry II

Credit(s): 3

A study of the mechanisms of reactions of organic compounds. SP

Prerequisite(s): CHM 210.

CHM 213 - Organic Chemistry II Lab

Credit(s): 2

Laboratory experience to accompany CHM 212. FA

Prerequisite(s): CHM 210, CHM 211, and CHM 212

CHM 318 - Biochemistry

Credit(s): 3

Study of chemical properties and metabolism of compounds of biological interest: carbohydrates, lipids, proteins, and nucleic acids. SP (Even Years)

Prerequisite(s): BIO 134, BIO 220, or BIO 250; CHM 212 (may be taken concurrently)

CIS 160 - Computer Science I

Credit(s): 4

Emphasis on programming in C and introduction to C++, including structural programming concepts, simple data types and structures, C and C++ syntax, operators, control structures secure coding skills. Lab exercises include techniques of coding, program design, and debugging. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information science must earn grades of B- or better in this course to progress to CIS 161 and/or CIS 210. FA

Prerequisite(s): Grade of B or better in MTH 095 or competency in arithmetic and algebra. For CS, Cybersecurity or MIS majors, CIS 120 is a pre- or co-requisite.

CIS 161 - Computer Science II

Credit(s): 4

Continuation of Computer Science I, with extensive programming in C++ language and introduction to Java. Includes secure coding skills, string handling, file I/O, storage and static variables, structures, bitwise operations, and C++ library. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information systems must earn grades of B- or better to progress to CIS 210 and above. SP

Prerequisite(s): CIS 120 and CIS 160.

CIS 210 - Object-Oriented Programming (Java)

Credit(s): 4

Introduction to concepts of abstract data type and inheritance. Topics include the fundamentals of object-oriented program design, secure coding skills, object-oriented programming using Java. Lab exercises include introductory to

intermediate level software analysis and design. FA

Prerequisite(s): CIS 161.

OR

CIS 200 - Scientific Computing Languages

Credit(s): 3

Covers an introduction to scripting languages and their applications to scientific data (currently Python programming language and the R-statistical analysis program will be taught). SP

Prerequisite(s): (MTH 125 or MTH 115)

Computer Science Application Area (25 credits)

CIS 160 - Computer Science I

Credit(s): 4

Emphasis on programming in C and introduction to C++, including structural programming concepts, simple data types and structures, C and C++ syntax, operators, control structures secure coding skills. Lab exercises include techniques of coding, program design, and debugging. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information science must earn grades of B- or better in this course to progress to CIS 161 and/or CIS 210. FA

Prerequisite(s): Grade of B or better in MTH 095 or competency in arithmetic and algebra. For CS, Cybersecurity or MIS majors, CIS 120 is a pre- or co-requisite.

CIS 161 - Computer Science II

Credit(s): 4

Continuation of Computer Science I, with extensive programming in C++ language and introduction to Java. Includes secure coding skills, string handling, file I/O, storage and static variables, structures, bitwise operations, and C++ library. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information systems must earn grades of B- or better to progress to CIS 210 and above. SP

Prerequisite(s): CIS 120 and CIS 160.

CIS 210 - Object-Oriented Programming (Java)

Credit(s): 4

Introduction to concepts of abstract data type and inheritance. Topics include the fundamentals of object-oriented program design, secure coding skills, object-oriented programming using Java. Lab exercises include introductory to intermediate level software analysis and design. FA

Prerequisite(s): CIS 161.

CIS 250 - Algorithms and Data Structures

Credit(s): 3

Introduction to the principles of algorithm analysis, abstract data types covering stacks, queues, lists, trees and recursion, algorithms of sorting and searching. Additional topics include graph algorithms, text compression, dynamic programming, and randomized algorithms. SP

Prerequisite(s): CIS 210.

- Plus three courses chosen from among the 300 and 400-level CIS courses. **Credit(s): 9**

Cybersecurity Application Area (24 credits)

CIS 125 - Introduction to Cybersecurity and Cyber Crime and Policies

Credit(s): 3

Introduces students to the fields of cybercrime and security. Employs the cross-cutting concepts of confidentiality, integrity, authentication, and availability to model the security properties of a system. Covers issues associated with different types of controls employed to defend against threats and attacks that exploit vulnerabilities in the system. The course also covers cybercrime laws, quantitative and qualitative risk assessment and implementation of security policies. Practical cryptography, establishing identity, physical and organizational security, security of operating systems, computer networks, applications and other types of computer systems will also be introduced. SP.

Prerequisite(s)/Corequisite(s): MTH 115.

CIS 160 - Computer Science I

Credit(s): 4

Emphasis on programming in C and introduction to C++, including structural programming concepts, simple data types and structures, C and C++ syntax, operators, control structures secure coding skills. Lab exercises include techniques of coding, program design, and debugging. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information science must earn grades of B- or better in this course to progress to CIS 161 and/or CIS 210. FA

Prerequisite(s): Grade of B or better in MTH 095 or competency in arithmetic and algebra. For CS, Cybersecurity or MIS majors, CIS 120 is a pre- or co-requisite.

CIS 161 - Computer Science II

Credit(s): 4

Continuation of Computer Science I, with extensive programming in C++ language and introduction to Java. Includes secure coding skills, string handling, file I/O, storage and static variables, structures, bitwise operations, and C++ library. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information systems must earn grades of B- or better to progress to CIS 210 and above. SP

Prerequisite(s): CIS 120 and CIS 160.

CIS 210 - Object-Oriented Programming (Java)

Credit(s): 4

Introduction to concepts of abstract data type and inheritance. Topics include the fundamentals of object-oriented program design, secure coding skills, object-oriented programming using Java. Lab exercises include introductory to intermediate level software analysis and design. FA

Prerequisite(s): CIS 161.

OR

CIS 200 - Scientific Computing Languages

Credit(s): 3

Covers an introduction to scripting languages and their applications to scientific data (currently Python programming language and the R-statistical analysis program will be taught). SP

Prerequisite(s): (MTH 125 or MTH 115)

Plus Nine Credits from One of the Categories Below

Operating Systems

CIS 355 - Principles of Operating Systems

Credit(s): 3

Topics cover the theoretical aspects and concepts of operating systems including system structures, scheduling, concurrent processes and deadlock handling, storage and file management, system protection and security. Also includes lab exercises in UNIX system configuration. SP

Prerequisite(s): CIS 161, CIS 120 or MTH 120.

AND

CIS 356 - Operating System Security and Administration

Credit(s): 3

Covers fundamental knowledge of Linux and Windows operating systems administration and security with an emphasis on operating system installation, configuration, administration, and system confidentiality and availability. Topics include operating system setup, user account control, file system protection, activity logging, system call auditing, address space management, and intrusion detections. SP

Prerequisite(s): CIS 120, CIS 125 and CIS 161. **Prerequisite(s)/Corequisite(s):** CIS 355

One of the Following

CIS 405 - Principles of Cryptography

Credit(s): 3

Cross-listed with: CIS 405 is cross-listed with CIS 535. To distinguish CIS 535 from CIS 405 additional or differentiated assessments and/or assignments appropriate to the graduate level will be assigned.

Includes the fundamentals of cryptography including the concept of obscuring functions, cryptographic techniques, types of ciphers, proper uses of ciphers, ethical uses of cryptography and decryption practices. Topics also include randomness, polymorphism and current trends in cryptography. Students will learn how to use cryptographic techniques to master the cross-cutting cybersecurity concepts of confidentiality and integrity in system design. They will also learn how to think like an adversary when analyzing the strengths and weaknesses of cryptographic algorithms. FA (Even).

Prerequisite(s): CIS 125, CIS 161 and MTH 120.

CIS 415 - Server Security and Maintenance/Troubleshooting

Credit(s): 3

Covers the security principles and practices used to protect the confidentiality, integrity and availability of different types of servers, such as file server, database server, web server, Lightweight Directory Access Protocol (LDAP) server, mail server and Domain Name server (DNS). Server installation, configuration, maintenance and troubleshooting will be studied. FA (Even)

Prerequisite(s): CIS 120, CIS 125 and CIS 356

CIS 425 - Digital Forensics and Analysis

Credit(s): 3

Cross-listed with: CIS 425 is cross-listed with CIS 525. To distinguish CIS 525 from CIS 425 additional or differentiated assessments and/or assignments appropriate to the graduate level will be assigned.

Covers the technical and legal issues facing digital forensic examiners. Students will learn effective and appropriate forensic response strategies to support cybercrime investigative efforts, and to assess and manage risks. The focus is on acquiring the skills needed to identify and collect potentially harmful digital evidence from computers and mobile devices, to analyze that evidence using chain of custody methods and to report forensic findings. FA (Odd)

Prerequisite(s): CIS 125 and CIS 356.

CIS 432 - Ethical Hacking

Credit(s): 3

Cross-listed with: CIS 432 is cross-listed with CIS 591. To distinguish CIS 591 from CIS 432 additional or differentiated assessments and/or assignments appropriate to the graduate level will be assigned.

This course introduces the tools and techniques associated with the cybersecurity practice known as ethical hacking or penetration testing. The course covers not only laws and regulations, but also the steps in penetration testing such as planning, scanning, exploiting, and result reporting. Students are taught how system vulnerabilities are discovered and exploited. They will also learn how to avoid vulnerabilities and how to react and defend if they do occur as well as how to design controls to prevent future attacks in real-life situations. Other topics include: system, wireless, web, and database hacking; penetration testing methods and tools. The course is designed to provide a rich learning experience to students through the use of hands-on exercises and discussions on the course material. The cross-cutting concepts which are emphasized in this course will be: risk, and adversarial thinking. SP (Odd)

Prerequisite(s): CIS 125 and CIS 161. **Prerequisite(s)/Corequisite(s):** CIS 356.

Networking

CIS 340 - Concepts of Telecommunications and Networking

Credit(s): 3

Introduction to the principles and practice of data communication and computer networking. Topics include the theoretical aspects of various methods, media, protocols, data compression, and security in telecommunication. Also includes lab exercises of network and remote access configuration and data exchange. FA (Odd)

Prerequisite(s): CIS 161 and (CIS 120 or MTH 120 and (MTH 150 or consent of the instructor).

CIS 405 - Principles of Cryptography

Credit(s): 3

Cross-listed with: CIS 405 is cross-listed with CIS 535. To distinguish CIS 535 from CIS 405 additional or differentiated assessments and/or assignments appropriate to the graduate level will be assigned.

Includes the fundamentals of cryptography including the concept of obscuring functions, cryptographic techniques, types of ciphers, proper uses of ciphers, ethical uses of cryptography and decryption practices. Topics also include randomness, polymorphism and current trends in cryptography. Students will learn how to use cryptographic techniques to master the cross-cutting cybersecurity concepts of confidentiality and integrity in system design. They will also learn how to think like and adversary when analyzing the strengths and weaknesses of cryptographic algorithms. FA (Even).

Prerequisite(s): CIS 125, CIS 161 and MTH 120.

CIS 445 - Network Security and Management

Credit(s): 3

Cross-listed with: CIS 445 is cross-listed with CIS 530. To distinguish CIS 530 from CIS 445 additional or differentiated assessments and/or assignments appropriate to the graduate level will be assigned.

Covers network security and management with an emphasis on computer network security, implementation, and management. Topics include network core devices (such as routers and switches) setup, configuration, maintenance, security, and firewall management. The cross-cutting concepts which are emphasized in this course will be: confidentiality, integrity, availability, and risk. FA Odd.

Prerequisite(s): CIS 120 and CIS 125. CIS 340 is a pre- or co-requisite.

Web Server & Development

CIS 215 - Database Fundamentals and Web Server Programming

Credit(s): 3

An introduction to server technology, database fundamentals and web server programming. Topics include system architecture, file servers, FTP servers, web servers, database servers with an emphasis on server installation and configuration as well as table design and management, creating and using queries and writing programs on the server to support a web site. FA Odd.

Prerequisite(s): CIS 160 and CIS 161.

CIS 380 - Web Development Security

Credit(s): 3

Covers web development security with an emphasis on the fundamental principles of security in web applications. Topics include web browser security, server-side web application security and web database security. The cross-cutting concepts which are emphasized in this course will be confidentiality, integrity, availability, risk, and adversarial thinking. FA (Even)

Prerequisite(s): CIS 120, CIS 125 and CIS 215

CIS 405 - Principles of Cryptography

Credit(s): 3

Cross-listed with: CIS 405 is cross-listed with CIS 535. To distinguish CIS 535 from CIS 405 additional or differentiated assessments and/or assignments appropriate to the graduate level will be assigned.

Includes the fundamentals of cryptography including the concept of obscuring functions, cryptographic techniques, types of ciphers, proper uses of ciphers, ethical uses of cryptography and decryption practices. Topics also include randomness, polymorphism and current trends in cryptography. Students will learn how to use cryptographic techniques to master the cross-cutting cybersecurity concepts of confidentiality and integrity in system design. They will also learn how to think like an adversary when analyzing the strengths and weaknesses of cryptographic algorithms. FA (Even).

Prerequisite(s): CIS 125, CIS 161 and MTH 120.

Data Analytics Application Area (29 credits)

CIS 200 - Scientific Computing Languages

Credit(s): 3

Covers an introduction to scripting languages and their applications to scientific data (currently Python programming language and the R-statistical analysis program will be taught). SP

Prerequisite(s): (MTH 125 or MTH 115)

CIS 160 - Computer Science I

Credit(s): 4

Emphasis on programming in C and introduction to C++, including structural programming concepts, simple data types and structures, C and C++ syntax, operators, control structures secure coding skills. Lab exercises include techniques of coding, program design, and debugging. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information science must earn grades of B- or better in this course to progress to CIS 161 and/or CIS 210. FA

Prerequisite(s): Grade of B or better in MTH 095 or competency in arithmetic and algebra. For CS, Cybersecurity or MIS majors, CIS 120 is a pre- or co-requisite.

CIS 161 - Computer Science II

Credit(s): 4

Continuation of Computer Science I, with extensive programming in C++ language and introduction to Java. Includes secure coding skills, string handling, file I/O, storage and static variables, structures, bitwise operations, and C++ library. Students in this course who are majoring in mathematics, computer science, cybersecurity or management information systems must earn grades of B- or better to progress to CIS 210 and above. SP

Prerequisite(s): CIS 120 and CIS 160.

CIS 330 - Database Management Systems

Credit(s): 3

Provide comprehensive data management and integrity, database design and evaluation, query design and evaluation, and web interfacing. Students will learn all the steps from data modeling (ER diagrams) to table generation and linking to accessing and querying using SQL to enhance data availability. FA

Prerequisite(s): CIS 161.

MTH 315 - Advanced Statistics

Credit(s): 3

Covers widely used statistical tools such as linear and nonlinear regression, analysis of variance, expected mean squares and pooling. Students will use a statistical package to analyze data sets. FA (Even)

Prerequisite(s): (MTH 115 or MTH 125) and MTH 150 or consent of instructor.

MTH 325 - Theory and Applications of Probability

Credit(s): 3

Introduces the mathematical treatment of random phenomena occurring in the natural, physical, and social sciences. Topics include combinatorial analysis, binomial distribution, Poisson and normal approximation, random variables and probability distributions, generating functions, Markov chains applications. SP (odd)

Prerequisite(s): MTH 115 or MTH 125 and MTH 150.

MTH 435 - Big Data Analysis and Visualization

Credit(s): 3

Cross-listed with: MTH 435 is cross-listed with CIS 557 . To distinguish MTH 435 from CIS 557 additional or differentiated assessments and/or assignments appropriate to the graduate level will be assigned.

Provides a survey of the concepts and skills associated with data analytics and visualization. The course will focus on probability sampling and complex survey data collection methods used to analyze and visualize data collected in

statistical surveys. Mobile, online and multi-mode surveys will be the sources of the data collection process. Application areas such as marketing and social engineering will be studied, along with the ethical considerations one must keep in mind when interpreting data. SP Odd

Prerequisite(s): CIS 200 **Prerequisite(s)/Corequisite(s):** MTH 325

MTH 455 - Machine Learning I

Credit(s): 3

Cross-listed with: MTH 455 and CIS 555 are cross-listed. To distinguish MTH 455 from CIS 555 additional or differentiated assessments and/or appropriate to the graduate level will be assigned.

Covers data analysis methods to recognize trends and patterns of big data. The emphasis will be on classification, regression and model fitting. Application areas such as healthcare, finance, game playing, marketing and internet fraud detection will be studied. FA Odd Years

Prerequisite(s): MTH 115 and CIS 200.

MTH 470 - Deep Learning

Credit(s): 3

Cross-listed with: MTH 470 is cross-listed with CIS 558 . To distinguish MTH 470 from CIS 558 additional or differentiated assessments and/or assignments appropriate to the graduate level will be assigned.

Focuses on deep learning, which is a subset of machine learning, to predict the characteristics of data based on the hierarchical structure of the data. Deep learning covers advanced supervised/unsupervised methods of classification and regression, structured prediction and anomaly detection with an emphasis on the development of the algorithms used to simulate high-level abstractions of data based on low-level layers. Models such as unsupervised Bayesian, Inference procedures and non-parametric models will be discussed. SP Even

Prerequisite(s): MTH 455

Education Application Area (29 credits)

EDU 268 - Introduction to Learner Development

Credit(s): 3

This course investigates the psychological development of the child and adolescent through exploring prior experiences and how they impact learning. This course includes an examination of instructional strategies that promote critical thinking and instructional resources, including media communication tools that benefit the teaching and learning processes. Strategies for content literacy are explored through academic language, teaching methodologies, and consultation and collaboration. Mission Core II Course FA, SP

EDU 269 - Critical Skills in the Teaching Profession with Field Experience

Credit(s): 3

This course investigates the contextual factors of a classroom to examine the role of the educator and the need for curriculum and instructional strategies, evaluation processes, classroom motivation and management skills, and planning for learner diversity. This course also includes an analysis of the history and philosophy of education, along with the legal and ethical aspects of teaching. Guided field experiences provide opportunities to review the critical skills needed in the teaching profession. FA, SP Background Check Required.

EDU 270 - Introduction to Learner Diversity