



## ONE HEALTH MAJOR

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The health of people, animals and the environment are intimately connected. This major recognizes these connections and studies health at their intersection. As the human population grows and the health of the environment degrades, humans are coming into closer contact with animals. Because of this, countries may see more zoonotic diseases (e.g. Ebola) spreading to human populations. As human populations grow, they put more pressure on the environment and introduce more environmental chemicals, many with unknown and some with transgenerational effects. This major will set the scientific foundation and then explore some of the vectors that transmit disease, discuss global health issues, examine personal ethics, investigate the impacts of chemistry and delve into the interface of human, animals and the environment. This major will prepare students to address these One Health issues. Students with this major may find employment in both the public health sector as well as in wildlife biology or veterinary science.

Students majoring in One Health may not also major or minor in Biology or Environmental Science. Students may double major in Biochemistry (Biological Emphasis) but must do so in close coordination with the Department of Biological and Environmental Sciences. In order to earn a Major in One Health, students must earn a letter grade of C- or better in all listed courses needed to satisfy major requirements. At least 50% of all One Health hours used to satisfy the major must be Westminster Courses.

You can find the course descriptions for all courses required for this major by clicking on the following links:

- [Biology Course Descriptions](#)
- [Chemistry Course Descriptions](#)
- [Environmental Science Course Descriptions](#)
- [Health and Exercise Science Course Descriptions](#)
- [Mathematics Course Descriptions](#)
- [Philosophy Course Descriptions](#)
- [Religious Studies Course Descriptions](#)

Major: **ONE HEALTH**

Student's Last Name

First Name

Middle Initial

Advisor

Date Major Declared

Course #	Title of Course	Hours Required	Semester Completed	Grade
<b>Required Courses: (22 hrs.)</b>				
BIO 114/115	Bioprocesses	4		
BIO 124/125	Biodiversity	4		
CHM 114/115	General Chemistry I	4		
CHM 124/125	General Chemistry II	4		
ENV 105	Intro. to Environmental Science	4		
MAT 114	Statistics	3		
<i>Students are encouraged to complete the above courses in their first 3-4 semesters.</i>				
<b>Disease Transmission &amp; Suppression (Complete one) (3-4 hrs.)</b>				
BIO 300	Immunology	3		
BIO 303	Microbiology	4		
BIO 315	Entomology	4		
BIO 330	Virology (BIO 301 recommended)	3		
<b>Human Health (6 hrs.)</b>				
<b>Required:</b>				
HES 261	Intro to Epidemiology	3		
<b>Complete one:</b>				
HES/GTS 240	Intro to Global Public Health	3		
HES/WGS 355	Women's Health Issues	3		
HES 357	Community Nutrition	3		
<b>Ethical Perspectives and the Environment (Complete one) (3 hrs.)</b>				
PHL 246	Environmental Ethics	3		
REL 324	Religion and the Environment	3		
<b>Animals Interacting with their Environment (Complete one) (3-4 hrs.)</b>				
BIO 205	Ecology & Field Biology	4		
ENV 350	Conservation Biology	3		
<b>The Health Impacts of Chemistry (Complete one) (3 hrs.)</b>				
BIO 310	Environmental Toxicology	3		
CHM 410	Medicinal Chemistry	3		
<b>Capstone (1 hr)</b>				
BIO/ENV/HES 400	One Health Capstone	1		
<b>TOTAL HOURS FOR MAJOR</b>		<b>41-44 hrs.</b>		

If any substitutions or waivers of requirements are allowed, please list below and initial.

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## **BIO – Biology**

**BIO 114 Biological Processes** (3 hrs.). An introduction for the beginning student to fundamental organism and cellular processes such as molecular and Mendelian genetics and photosynthesis. Students must take this course in conjunction with BIO 115. This course is typically offered once per academic year in the fall semester. BIO 114/115 will satisfy the Scientific Inquiry (lab) Context in Tier II of New Foundations and the Natural Science Inquiry Theme of Breakthrough general education programs.

**BIO 115 Biological Processes Laboratory** (1 hr.). Students conduct laboratory exercises selected to reinforce and augment lecture topics in BIO 114. Students are involved in setting up and management of experiments and in analysis of collected data. Students must take this course in conjunction with BIO 114. This course is typically offered once per academic year in the fall semester. BIO 114/115 will satisfy the Scientific Inquiry (lab) Context in Tier II of New Foundations and the Natural Science Inquiry Theme of Breakthrough general education programs.

**BIO 124 Biodiversity** (3 hrs.). This course acquaints students with the major subdivisions of the living world. Anatomical, morphological and life cycle characteristics of representatives of the various phyla and classes are introduced and phyletic and functional interrelationships are stressed wherever feasible. Students must take this course in conjunction with BIO 125. This course is typically offered once per academic year in the spring semester. BIO 124/125 will satisfy the Scientific Inquiry (lab) Context in Tier II of New Foundations and the Natural Science Inquiry Theme of Breakthrough general education programs.

**BIO 125 Biodiversity Laboratory** (1 hr.) This is a survey laboratory and is intended to demonstrate the changes in complexity of form and structure in both plants and animals as evolutionary processes have shaped organisms through geological time. Students must take this course in conjunction with BIO 124. This course is typically offered once per academic year in the spring semester. BIO 124/125 will satisfy the Scientific Inquiry (lab) Context in Tier II of New Foundations and the Natural Science Inquiry Theme of Breakthrough general education programs.

**BIO 204 Animal Behavior** (4 hrs.) This course will introduce students to the field of animal behavior focusing on an evolutionary approach. We will examine both proximate and ultimate causes for why animals behave as they do. Topics range from how neural mechanisms control behavior to why different types of mating systems have developed. This course focuses on how scientists study these areas. Students design and conduct experiments in animal behavior as part of the learning process. This course is typically offered every other academic year. Prerequisites: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115.

**BIO 205 Ecology and Field Biology** (4 hrs.) This course is designed to familiarize the student with the concepts and principles of ecology as a science. A wide variety of organisms and groups of organisms are studied in relation to various environmental conditions. Short local field trips are used to acquaint students with collecting, census, and ecological measurement techniques and devices. This course is typically offered every academic year in the fall semester. Prerequisites: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115.

**BIO 206 Laboratory Instruction Techniques** (1 hr.) This course is open to students who are qualified to serve as laboratory assistants in various biology courses. Students assist instructor in the laboratory and serve as mentors for students in course. This course is typically offered every semester during the academic year. Prerequisites: open by invitation to students who have earned an A or B average in NSC 108, BIO 124/125 (or BIO 100 General Biology I), or BIO 114/115.

**BIO 208 Functional Plant Morphology** (4 hrs.) This course is designed as an integrated study of the gross morphology, internal anatomy and physiology of vascular plants. Laboratory studies emphasize the interrelationships between plant form and function. This course is typically offered every other academic year in the spring semester. Prerequisites: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115.

**BIO 210 Biogeography** (3 hrs.) Biogeography is the study of the distribution of biodiversity over space and time. It aims to reveal where organisms live and at what abundance. It addresses the questions of which species, where and why (or why not). Biodiversity is viewed in light of historical factors, such as speciation and extinction, plate tectonics and glaciations, as well as in the light of current and future threats, including but not limited to climate change. This course is typically offered every other academic year. Prerequisites: BIO 124/125 and 114/115 for Biology and Environmental Science majors; NSC 108 and ENV 105 for non-majors.

**BIO 212 Research Methods in Biology and Environmental Sciences** (3 hrs.) Research methods will introduce you to tools and techniques used in the scientific research laboratory by offering a hands-on research experience allowing data collection, storage, and analysis. Topics include an examination of research types, design, and methodology, scientific communication, and data analysis. Prerequisites: BIO 114/115 and BIO 124/125 or CHM 114/115 and CHM 124/125. MAT 114 is recommended.

**BIO 301 Genetics** (4 hrs.) This course will be an introduction to and a survey of the science of genetics. Topics covered will include classical “Mendelian” genetics, population genetics, and modern molecular genetics. The laboratory will augment these approaches with traditional studies in fly genetics and current practices in molecular genetics. This course is typically offered once per academic year. Prerequisites: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115.

**BIO 302 Human Anatomy** (4 hrs.) This class is designed for students who are preparing for careers in health-related clinical or research professions or have a deep interest in understanding how the human body works. You will learn about the human form at the gross anatomical level delivered as a regional approach typical of professional schools. In the laboratory, we will be using anatomical models, skeletons, radiographs, and dissection to enhance your understanding of anatomy. This course will challenge you to apply this information to real world clinical and pathological problems. This course is typically offered every academic year in the fall semester. Prerequisites: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115.

**BIO 303 Microbiology** (4 hrs.) This course serves as an introduction to the structure, physiology, pathogenicity and ecology of microorganisms, particularly the bacteria and viruses. Laboratory work involves effective use of the microscope, staining procedures, handling of pure cultures, analysis of bacterial physiology and identification of unknown bacteria. This course is typically offered once each academic year in the fall semester. Prerequisites: BIO 124/125 (or BIO 100 General Biology I), BIO 114/115.

**BIO 310 Environmental Toxicology** (3 hrs.) In this course, you will be introduced to the field of environmental toxicology from a biological perspective. We will discuss uptake of chemicals from the environment, biotransformation, and toxicity. We will examine a wide array of endpoints from cellular biomarkers to population-level effects in invertebrates and vertebrates, including humans. Prerequisites: BIO 124/125 and BIO 114/115

**BIO 314 Vertebrate Histology** (2-4 hrs.) The aim of this course is to introduce students to the microscopic anatomy and histophysiology of vertebrates. Particular emphasis will be placed on the interrelation between structure and function. In addition, this course will teach students to become proficient in using the microscope to interpret fine structure. This course is typically offered as independent study. Prerequisite: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115.

**BIO 315 Entomology** (4 hrs.) This course focuses on the biology of insects with the following three objectives: (1) An introduction to common methods used in the field of entomology. (2) The ability to identify many common insect orders and families, since it is impossible to understand something if you do not know what it is. Finally, (3) an introduction to the evolution, behavior, and ecology of this fascinating group. This course is typically offered every other academic year in the fall semester. Prerequisites: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115.

**BIO 318 Ornithology** (4 hrs.) Ornithology is the study of avian biology (birds). The broad goals of this course will be to (1) introduce you to the evolution, behavior, and ecology of birds; and (2) provide you with the ability to identify many common bird species in the wild by sight, sound, behavior, and habitat. This course meets twice a week in a lecture/laboratory class setting. Several trips will be taken into the field to identify birds. Please note that on rare occasions, the class period may run 10-20 minutes longer to accommodate longer trips afield. This course typically is offered every other academic year in the spring semester. Prerequisites: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115.

**BIO 320 & 321: Biology in Belize** (4 hrs.) This course serves as an introduction to the natural history, geography, pre- and post-Columbian history, land-use patterns, and current political climate of Belize, Central America. Following a preparatory spring semester seminar (BIO 320), a three-week Summer Session course (BIO 321) will be taught in Belize where students will study the biota of the offshore caves, coral reefs, grassland savannas and neo-tropical jungles. Special attention will be paid to local land use and conservation issues and the effects of ecotourism on the local economy and relevant ecosystems. Prerequisites: Completion of at least two courses in biology or permission of the instructor.

**BIO 322 Vertebrate Biology** (4 hrs.) Vertebrate Biology takes a comparative approach to the study of the diversity of vertebrate life both extinct and extant. Anatomy, ecology, behavior, and evolutionary history will all be discussed as part of a broad introduction to the vertebrates. The dissection of representative species of the major vertebrate groups is the focus of the weekly laboratory. This course is typically offered every other academic year. Prerequisites: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115.

**BIO 325 Molecular Cell Biology** (4 hrs.) This course is a study of eukaryotic cells at the molecular level. Topics include protein biosynthesis and trafficking, membrane structure and function, cellular, subcellular, and extracellular structure, and the cell cycle. The course correlates the cellular structures to their function within the cell. The laboratory is designed to complement these topics, with an emphasis on student self-design. This course is typically offered once every one-two academic years. Prerequisites: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115. BIO 301 Recommended.

**BIO 328 Insects and Human Affairs** (3 hrs.) This course provides an introduction to insects and their interactions with humans. Human beings and insects will be compared with respect to both form and function, and students will learn to distinguish the major groups of insects. The course will examine the effects of insects on agriculture (both harmful and helpful), the impact of insects on the course of human history, and their representation in art, music, and literature. This course is typically offered every other academic year in the spring semester. BIO 328 will satisfy the Scientific Inquiry (non-lab) Context in Tier II of the General Education Program and the STEM and Society Explorative Cluster of Breakthrough general education program.

**BIO 330 Virology** (3 hrs.) This course will introduce students to the basic biology of viruses and then look at some contemporary issues that involve viruses. Topics covered will include the cellular and molecular mechanisms of virus reproduction including virus structure, virus-cell interactions, virus infection, oncogenes, and viral transformation of cells to cancer. We will also consider the evolution and ecology of viruses and the epidemiology of viral infections. Examples will be taken from bacterial, plant, and animal viruses, including newly emerging viruses. Contemporary topics will include the AIDS epidemic, emerging pathogens such as West Nile virus, bird flu, or Ebola virus, the renewed threat of smallpox, etc. Portions of the course will include student-led discussions of specialized topics of their choice. Prerequisites: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115. BIO 301 recommended.

**BIO 335 Medical Terminology** (1 hr.) The course is designed to help students develop a vocabulary for accurately describing the human body and associated components, conditions, processes. This systematic approach to word building and term comprehension is based on the concept of: (1) word roots, (2) prefixes, and (3) suffixes primarily derived from Latin and Greek origins. This course is typically offered every academic year. Prerequisites: BIO 124/125 (or BIO 100 General Biology I), BIO 114/115, and permission of instructor required.

**BIO 372 Developmental Biology** (4 hrs.) How does the fertilized egg transform into an organism? What changes over time lead to the specialized tissues and organs of animals? Developmental Biology is a survey of animal development, from sperm and unfertilized egg through embryonic development. Molecular, cellular, genetic, and organismal topics will be included. This course will complement your studies of genetics, cellular, animal, and human biology as we discuss how genotype becomes phenotype. The laboratory will include descriptive and experimental approaches. Typically offered every other year. Prerequisites: BIO 124/125 (or BIO 100 General Biology I), BIO 114/115 and BIO 301 (Or with permission).

**BIO 398 Independent Research Projects** (1-4 hrs.) Students interested in independent reading or developing individual research projects may enroll in BIO 398 for variable credit. The faculty in the department strongly encourages students majoring in biology to develop and pursue at least one research project. This course is typically offered every semester during the academic year. Prerequisites: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115, as well as permission of the department chair.

**BIO 404 Biochemistry** (4 hrs.) This course is an advanced survey course for students who expect to continue graduate study in biology or continue on to a professional career in a health-related field. Topics include a detailed study of the structure of biological molecules and the function of enzymes, followed by a survey of basic intermediary metabolism. The laboratory is a project-based laboratory incorporating many of the principles covered in lecture. This course is typically offered once each academic year in the spring semester. Prerequisites: CHM 314, 315, 324, and 325 (CHM 324 & 325 can be taken concurrently with BIO 404), BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115.

**BIO 415 Human Gross Anatomy** (4 hrs.) Students will complete a human dissection, as a team, with a minimum of 6 hours of contact per week. The dissection will be completed as it would in a medical school gross anatomy course, to include a complete regional dissection. Additionally, an assessment of the health of the donor will be completed. The students will be required to share their findings with the community and in other courses as appropriate. This course is typically offered once each academic year in the fall semester. Prerequisites: BIO 124/125 (or BIO 100 General Biology I), BIO 114/115, and BIO 302 (Must have been taken at Westminster). The course is by application and consideration of faculty in the department, and requires instructor permission.

**BIO 420 Physiology** (4 hrs.) This class is designed for students who have a deep interest in understanding how the human body works. Physiological principles and examples will be geared towards humans, but in many instances are also applicable to other vertebrates. You will learn about how the human body functions at molecular, cellular and systems levels. This course will challenge you to apply this information to real world clinical and pathological problems. You will be expected to critically evaluate current scientific literature and discuss recent scientific findings with your fellow classmates. You will learn how to use physiological lab equipment and then conduct an independent research project. This course is typically offered once each academic year in the spring semester. Prerequisites: BIO 114/115, BIO 124/125 (or BIO 100 General Biology I) and BIO 302 or BIO 322 with a grade of C- or better.

**BIO 450 Evolution** (3 hrs.) Evolution is the unifying theory of biology. This course will examine Charles Darwin's theory of evolution by means of natural selection looking at the development of this theory and its modern applications. Topics will include the fundamental mechanisms for evolution, including those that are both adaptive and neutral with respect to the process of adaptation; human evolution; the origin and definition of a species; molecular evolution; the relationship between evolution and religion; and modern challenges, modifications, and support for this far-reaching theory. This course is typically offered every academic year in the fall semester. Prerequisites: BIO 124/125 (or BIO 100 General Biology I) and BIO 114/115, junior or senior status.

## CHM – Chemistry

**CHM 105 Introduction to Chemistry** (3 hrs.) A survey course intended for non-science majors. Chemical phenomena, methodology, and theory are presented in the context of public policy issues such as air and water quality, the ozone layer, global warming, acid rain, and energy sources.

**CHM 106 Introduction to Chemistry Laboratory** (1 hr.) Laboratory experiences are provided that are relevant to the science and technology issues discussed in CHM 105. Meets three hours per week. Experimentation and data collection lead to an understanding of the scientific method and of the role that chemistry plays in addressing societal issues.

**CHM 114 General Chemistry I** (3 hrs.) A study of the fundamental principles and theories of chemistry with emphasis on stoichiometry, atomic theory, and bonding. This course is offered in every fall semester.

**CHM 115 General Chemistry I Laboratory** (1 hr.) Laboratory to accompany CHM 114. Meets three hours per week.

**CHM 124 General Chemistry II** (3 hrs.) A continuation of CHM 114 with emphasis on equilibrium, electrochemistry, kinetics, and thermodynamics. This course is offered every spring semester.

**CHM 125 General Chemistry II Laboratory** (1 hr.) Laboratory to accompany CHM 124. Meets three hours per week.

**CHM 304 Inorganic Chemistry** (3 hrs.) A survey of inorganic chemistry at the intermediate level. Emphasis is on descriptive chemistry with discussion also of atomic and molecular structure, bonding theory, coordination chemistry, and energy changes in inorganic reactions. Prerequisites: CHM 124/125.

**CHM 314 Organic Chemistry I** (3 hrs.) A systematic study of the compounds of carbon with emphasis on the principles of synthesis, analysis, and reaction mechanisms of organic functional groups. This course is offered every fall semester. Prerequisites: CHM 124/125.

**CHM 315 Organic Chemistry I Laboratory** (1 hr.) Laboratory to accompany CHM 314. A study of the techniques of synthesis and analysis of organic compounds. Meets three hours per week. Prerequisites: CHM 124/125.

**CHM 324 Organic Chemistry II** (3 hrs.) A continuation of CHM 314. This course is offered every spring semester.

**CHM 325 Organic Chemistry II Laboratory** (1 hr.) Laboratory to accompany CHM 324. Meets three hours per week.

**CHM 334 Analytical Chemistry I** (3 hrs.) A study of the principles and methods of quantitative analysis. Prerequisites: CHM 124/125.

**CHM 335 Analytical Chemistry I Laboratory** (1 hr.) Laboratory to accompany CHM 334. Gravimetric, volumetric and simple instrumental methods are studied. Meets three hours per week. Prerequisites: CHM 124/125.

**CHM 344 Analytical Chemistry II** (2 hrs.) Introduction to instrumental methods of analysis with emphasis on the principles of measurement and instrumentation. Prerequisites: CHM 334/335.

**CHM 345 Analytical Chemistry II Laboratory** (2 hrs.) Laboratory to accompany CHM 344. Methods may include polarography, spectrophotometry, chromatography, potentiometric titrations, and amperometric and conductometric determinations. Meets six hours per week.

**CHM 404 Biophysical Chemistry** (3 hrs.) Introduction to physical chemistry with special emphasis on biological applications. Topics to be discussed include thermodynamics, chemical and physical equilibria, and kinetics (especially enzyme kinetics). Designed for those students who would otherwise not be exposed to physical chemistry. Prerequisites: CHM 124/125, MAT 124.

**CHM 410 Advanced Topics in Chemistry** (3 hrs.) Special courses on various topics are offered under this listing. Past offerings include Medicinal Chemistry and Chemical Kinetics. May be repeated for credit with change of topic.

**CHM 422 Advanced Inorganic Chemistry** (3 hrs.) A study of the principles and theories of inorganic chemistry, emphasizing modern approaches to the field. Prerequisites: CHM 304, 324/325, MAT 224, and PHY 212, or permission of the instructor.

**CHM 424 Physical Chemistry I** (3 hrs.) Chemical thermodynamics and kinetics. Topics include properties of gases, laws of thermodynamics, free energy, chemical equilibrium, chemical kinetics, and rate laws. Additional topics may include chemical dynamic models, phase equilibrium, and electrochemistry. Prerequisites: CHM 124/125, MAT 214, and PHY 212 or PHY 213 or with permission of instructor.

**CHM 425 Physical Chemistry I Laboratory** (1 hr.) Laboratory to accompany CHM 424. Meets three hours per week. Prerequisites: CHM 324/325, CHM 344/345, MAT 224, PHY 212.

**CHM 434 Physical Chemistry II** (3 hrs.) Quantum and statistical mechanics. Topics include quantum mechanical theory, quantum mechanical models for motion, the structure of atoms and molecules, molecular spectroscopy, and statistical thermodynamics. Prerequisites: CHM 424.

**CHM 435 Physical Chemistry II Laboratory** (1 hr.) Laboratory to accompany CHM 434. Meets three hours per week.

## **ENV – Environmental Science**

**ENV 105 Introduction to Environmental Sciences** (4 hrs.) This course investigates global, national, regional, and local environmental issues by critically analyzing available data and examining alternative to current situations. Emphasis is placed on the use of scientific methods to investigate and solve environmental problems. Off-campus field trips are required. Class projects seek to extend the implications of the course material to the campus and local communities. Offered most semesters.

**ENV 210 Biogeography** (3 hrs.) Biogeography is the study of the distribution of biodiversity over space and time. It aims to reveal where organisms live and at what abundance. It addresses the questions of which species, where and why (or why not). Biodiversity is viewed in light of historical factors, such as speciation and extinction, plate tectonics and glaciations, as well as in the light of current and future threats, including but not limited to climate change. This course is typically offered every other academic year in the spring semester. Prerequisites: BIO 124/125 and 114/115 for Biology and Environmental Science majors; NSC 108 and ENV 105 for non-majors.

**ENV 350 Conservation Biology** (3 hrs.) Conservation biology is the scientific study of the nature and status of Earth's biodiversity with the aim of protecting species, their habitats, and ecosystems from excessive rates of extinction. It is an interdisciplinary subject drawing on sciences, economics, and the practice of natural resource management. A variety of topics and issues will be explored, including but not limited to: factors contributing to the decline of populations, the problems of habitat loss, isolation and fragmentation, ecosystem management, restoration ecology and sustainable development. This course is typically offered every other academic year in the spring semester. Prerequisites: BIO 124/125 and 114/115 or ENV 105.

**ENV/ECN 377 Environmental and Resource Economics** (3 hrs.) This course will introduce students to the theories and methods used to understand and evaluate environmental problems and policies. The class will provide students the much-needed exposure to the non-competitive markets, the methods to analyze such markets, and the effects of these markets on economic institutions. The objective of this course is to introduce students to theories and methods used to understand and evaluate the environmental problems and policies. We will start with concepts of externalities, public goods, property rights and why markets could fail in these cases. Policies to correct market failure in domestic and international situations will be examined. Students will explore the common property problem in case of renewable resources and the public policies used to correct the problem. This course is offered every other spring semester. Prerequisites: MAT 122 or MAT 124, and ECN 212.

**ENV 405 Environmental Assessment** (3 hrs.) Tools, methods, and techniques employed in the study of environmental impact assessment and resource management. Research fundamentals and related environmental legislation will be studied and applied to environmental problems and resource evaluation. The major product is the development of a project requiring an EIS, researching the alternatives, gathering information, writing, and presenting the report. Offered every other fall semester. Prerequisites: ENV 105, GEO 108 or GEO 110 and Junior or Senior standing.

## **HES – Health and Exercise Science**

**HES 101 Intro to Exercise Science** (1 hrs.) This class will provide an opportunity for students to understand the scope of health professions related to Exercise Science as they begin their studies in the major and explore professions: e.g. medicine, nursing, physician assistant, physical therapy, occupational therapy, personal training, dietetics, chiropractic, strength and conditioning coaching. Students will also meet with WC Career Services, learn about major requirements/ advising, how to write professionally, and how to track and reflect on their progress in the major through major's portfolio (in Canvas).

**HES 104 First Aid and Cardiopulmonary Resuscitation (Fee)** (1 hr.) Designed around the National American Red Cross modules, this course will provide students with the knowledge and skills necessary in an emergency. The content and activities will prepare students to recognize emergencies and make appropriate decisions regarding care. It will also provide information on the prevention of injury and illness, with a focus on personal safety. Offered fall and spring semesters.

**HES 132 Wellness Concepts** (2 hrs., second block, Spring semester) Students identify their current wellness status, acquire accurate wellness information, and develop skills to analyze health claims, and work toward personal wellness objectives. Physical Education Majors will take this course concurrently with Physical Fitness (PED A22) to meet state requirements for health-related fitness and wellness. Offered spring semester.

**HES 204 Fitness and Wellness Concepts** (3 hrs.) Students' baseline fitness values are assessed, fitness principles are learned, and training and behavioral strategies are developed through in-class activities. Students identify their current wellness status, acquire wellness information, develop skills to analyze health claims, and work toward personal wellness objectives. Offered spring semester.

**HES 205 Stress Management** (3 hrs.) This course introduces students to basic principles and theories of stress and techniques to effectively manage stress. Based on holistic health perspective, student will identify the various causes of stress and be introduced to a variety of stress management techniques and stress-reducing behaviors. Ultimately, students will develop and practice approaches that will contribute to optimal lifelong health.

**HES/EDU 206 Elementary Physical Education Methods** (3 hrs.) This course is meant to prepare students to teach physical education and movement activities to elementary school children. By identifying patterns of growth and development, students will be able to develop methods to successfully teach fundamental movement skill and physical education concepts through quality instruction, games, dance, health-related fitness and perceptual-motor activities. This course is for K-9, K-12 physical education majors. Offered in spring odd semesters.

**HES/EDU 207 School Health, Physical Education and Safety in Elementary** (3 hrs.) This course examines the principles of teaching health, physical fitness, and safety for wellness and optimal development with an emphasis on the needs of children. Offered in fall semesters.

**HES 208 Creative Movement and Rhythms** (3 hrs.) An introduction to the elements of creative movement and dance. Through a variety of learning experiences, students will examine movement forms as more than just physical activity, but as a means of self-expression and a vital aspect of culture. This course will give students practice in designing movement-learning experiences for persons of all ages. Offered in fall semester.

**HES 215 Principles of Motor Learning** (3 hrs.) The class will include lecture and laboratory experiences to study the principles and factors that influence motor skill acquisition and development. With an understanding of the theoretical bases, students will learn methods and teaching approaches that improve motor skill development and retention. Offered in odd numbered spring semesters.

**HES 220 Social Science in Sport** (2 hrs.) An analysis of the significance of physical activity in society and culture. Motivation and self-concept as applied to play, game, sport, and athletics are examined. Offered in fall semester.

**HES/PSY 231 Sports Psychology** (3 hrs.) An examination of the psychological factors influencing participants and, to a lesser extent, spectators in sport. Topics include the use of behavioristic principles to develop skills, and the effects of causal attribution, attention, anxiety, coaching strategy, and imagery on athletic performance. Additional special topics include audience effects, children in sports, and the psychological benefits of exercise. Offered in fall semester.

**HES 232 Care and Prevention of Athletic Injuries** (3 hrs.) This course is designed to provide students with introductory information concerning primary injury care and management, with a special emphasis on the preventative aspects of athletic injuries. Students will learn the practical techniques for applying terminology and anatomy for evaluation and care of various injuries as they pertain to the knee, ankle, shoulder, elbow, spine, and head/face. Students will also be introduced to basic modalities used in the field of athletic training, basic training and conditioning guidelines, and how to deal with environmental issues as they pertain to athletics as well as apply those skills in the practical setting. Additional information regarding legal and organizational issues will also be addressed. (Previously offered as HES 230/235).

**HES/GTS 240 Introduction to Global Public Health** (3 hrs.) The course will study foundational public health concepts in a global context, using an evidence-based approach. Students will understand the complexities inherent in improving health on a global scale, the impact of poverty and inequality, the role of institutions and major players in global health, and the link between global and local health problems and solutions. General Education credit is earned through class activities in which students explore aspects of various cultures (history and tradition, institutions such as family and faith communities, economy, politics and law) and their impact on health status and strategies for prevention and treatment of disease. Offered in fall semester.

**HES 251 Introduction to Nutrition** (3 hrs.) This is an introductory nutrition class covering the major nutrients (carbohydrates, lipids, proteins, vitamins, minerals, and water) and their role in energy balance, weight management, the digestive process, and overall health. Students will learn the basics of healthy eating through the life cycle along with the basic nutritional science concepts of metabolism and digestion. Students will also learn about nutrition misinformation, fad diets, and food politics. This course will give students the fundamental knowledge they will need to make informed decisions about foods. Course fee required. Offered in fall semester.

**HES 261 Introduction to Epidemiology** (3 hrs.) This course will introduce basic principles and concepts of epidemiology by describing the various ways that disease (and other health-related conditions and events) occurs in populations. The course will emphasize the practical use of epidemiology and lectures will be complemented by case studies and readings of contemporary issues in disease and public health. Offered online spring semester.

**HES 309 History and Philosophy of Physical Education** (2 hrs.) Designed to assist students to develop an historical perspective and viable personal philosophy of physical education. Offered in fall odd semesters.

**HES 321 Kinesiology** (3 hrs.) The study of human motion through the application of anatomical and physiological fundamentals, as well as basic biomechanical principles. Information will be presented in a lecture/ laboratory format. Prerequisites: BIO 107 or BIO 114/115 or BIO 124/125.

**HES 340 Exercise Physiology** (3 hrs.) This course is designed to study the responses and adaptations of the functions of the human body to physical exercise, and the contribution of exercise to optimal health. This course integrates the knowledge of biological processes and applies it to sport and exercise. The material covered is pertinent to teaching, coaching, and appropriate for students interested in health and exercise. Prerequisites: BIO 114/115 and BIO 124/125 (with a grade of B- or higher) or BIO 107. Offered fall semester.

**HES 342 Exercise Prescription** (3 hrs.) The class will cover general principles of exercise prescription for healthy persons and individuals with special needs. Particular emphasis will be on training to improve fitness and performance. Fitness testing and risk factor assessment will be the basis of developing a safe effective exercise program. Course Prerequisite: HES/PED 340 Exercise Physiology. Offered spring semester.

**HES 350 Theories of Adapted Physical Education** (3 hrs.) Designed to identify exceptional children and to provide a learning environment suitable to their needs and capabilities. Offered in spring of odd numbered years, even fall semesters. Requires two hours of lecture and one hour of activity.

**HES/WGS 355 Women's Health Issues** (3 hrs.) This course will explore the topic from three perspectives: holistic health perspective, a developmental perspective, and sociocultural or global perspective. Readings, discussion, lecture, writings, research, and presentations will consider these perspectives

in better understanding women's health issues. Prerequisite: One course from the following: PSY 112, PSY 113, NSC 108, BIO 114/115, SOC 111, WGS 210, REL 102. Offered spring odd semesters.

**HES 357 Community Nutrition** (3 hrs.) Student will explore the interrelationships between nutrition and health in community settings (local and global communities). The effect of socio-economic, environmental, cultural, and political factors on health and nutritional status will be examined. Food and nutrition policies and interventions designed to enhance the well-being of populations groups will be discussed. Each student will complete a culminating service learning project based on interest area derived from class readings, discussion and experiences. Prerequisites: One course from the following: PSY 112 or 113; BIO 107, 108, 114, or 124; SOC 111; ECN 212; POL 112; or PHL 101. Course fee required. Offered spring semester.

**HES 398 Independent Study** Advanced study in health and/or physical education not covered in regular course offerings. Students work on a subject selected in conference with the instructor.

**HES 399 Internship** Supervised experience in a cooperative program with business, government, community, or related establishment in the areas of health and/or physical education.

**HES 405 Measurement and Evaluation in Physical Education** (2 hrs.) An examination of various tools of measurement and an analysis of the purposes, values and limitations of measurement tools in relation to objectives. Field experience is included. Offered in spring of odd numbered years. Prerequisites: MAT 114. Offered spring semester.

**HES 406 Management in Physical Education and Athletics** (2 hrs.) A study in the development and promotion of educationally sound programs. Offered in spring of odd numbered years. Offered spring semester.

## MAT – Mathematics

**MAT 110 Quantitative Reasoning for Mathematical Problem Solving** (3 hrs.) This course emphasizes basic mathematical principles through problem solving. The focus is on solving problems encountered in typical college courses such as interpreting graphs, applying formulas, computing interest and percentages, understanding statistical output, and solving equations. The quantitative reasoning approach builds critical thinking skills in solving problems and analyzing the outcomes of those contextually. This course is designed for those students who will broadly use mathematics in everyday life, with less technical emphasis on skills for future math courses. This course is for those who do not intend to major in programs requiring additional mathematics. Offered every semester. Prerequisites: None

**MAT 111 College Algebra** (3 hrs.) The study of linear, quadratic, exponential and logarithmic equations, inequalities, functions and graphs and their applications. Prerequisites: ACT math score between 19 and 23 or SAT math score between 410 and 530 or Accuplacer Advanced Algebra and Functions score of 241 and at least 2 years of high school algebra with at least C's. Not meeting prerequisite requires the student to successfully complete MAT 110 as the Foundational Mathematics requirement. Offered every semester, one or more sections depending on demand.

**MAT 114 Elementary Statistics** (3 hrs.) A study of the organization and analysis of data including the normal, binomial, chi square and t distributions; estimating population parameters; hypothesis testing; random sampling; central limit theorem; and simple linear regression and correlation. A term project using technology for analysis and testing of data collected from real life is a required component of the course. Prerequisites: ACT math score 23 or SAT math score 540 and 4 years of high school math, including 2 years of algebra with at least B's. Not having prerequisite requires the student to successfully complete MAT 110 Quantitative Reasoning for Mathematical Problem Solving or MAT 111 College Algebra with a grade of C- or better. Offered every semester.

**MAT 115 Fundamentals of Data Science** (3 hrs.) The focus of this course is to introduce the scientific methods and processes used to analyze large data sets and predictive modeling methods. The course will use statistical methods and exploration techniques to investigate patterns and anomalies in mostly structured large data sets. Underlying theories of statistics will be utilized to explore, interpret, and visualize data in interdisciplinary fields such as health, business, education, and economics. An introduction to R programming language and R Studio will be used throughout the course. Pre-requisites: Evidence of college level statistics course with a grade of C- or better, a math ACT of 25 or higher, a math SAT score of 610 or higher, or AP stats with a score of "4" or higher. Offered spring semester.

**MAT 121 Pre-Calculus** (3 hrs.) The study of trigonometric, exponential, logarithmic and algebraic functions and their applications. Pre-Calculus is a course for students who plan to take Calculus I. Prerequisites: ACT math score 22 or SAT math score 540 and at least 4 years of high school math, including 2 years of algebra with at least B's. Not meeting prerequisite requires the student successfully complete MAT 111 with a grade of C- or better. Offered every semester or depending upon demand.

**MAT 122 Business Calculus** (3 hrs.) A terminal calculus course, including a brief review of algebra and the study of the derivatives and integrals of algebraic, exponential and logarithmic functions. Business applications of the derivative and the definite integral are also studied. Prerequisites: ACT math score 23 or SAT math score 540 and at least 4 years of high school math, including 2 years of algebra and some pre-calculus with at least B's. Students not meeting these prerequisites requires the students to successfully complete MAT 111 with a grade of C- or better. Offered every semester or depending upon demand.

**MAT 124 Calculus I** (5 hrs.) A formal introduction to calculus, including limits, derivatives, techniques of differentiation, optimization, anti-derivatives, definite integrals, and the fundamental theorem of calculus. Applications in science and engineering are included. Prerequisites: ACT math score of 25 (27 preferred) or SAT math score of 600 (630 preferred) and at least 4 years of high school math, including a pre-calculus or trigonometry course with a grade of at least B. Not having prerequisite requires the student to successfully complete MAT 121, Pre-calculus with a grade of C- or better. Offered every semester.

NOTE: A course **leading to the fulfillment** of the Breakthrough math requirement (MAT 114 or MAT 124) must be taken in the first year (MAT 090 Intermediate Algebra, MAT 111 College Algebra, MAT 114 Elementary Statistics, MAT 121 Pre-Calculus, or MAT 124 Calculus I).

**MAT 214 Calculus II** (4 hrs.) A continuation of MAT 124. This course includes integration of standard forms (integration by parts, trigonometric substitution, etc.), the definite integral, applications of integration and the study of sequences and series. Prerequisites: Completion of MAT 124 with a C- or better, or permission of the instructor. Offered every semester or depending upon demand.



**MAT 215 Linear Algebra** (3 hrs.) An introduction to the concepts of linear transformations and matrices, determinants, vector spaces, eigenvalues, and selected applications. Prerequisites: Completion of MAT 124 with a C- or better. Offered every fall semester.

**MAT 224 Calculus III** (4 hrs.) A continuation of MAT 214. This course includes solid analytic geometry, an introduction to vector analysis and differential geometry, partial differentiation and multiple integration. Prerequisites: Completion of MAT 214 with a C- or better. Offered every semester or depending upon demand.

**MAT 231 Mathematics for Elementary & Middle School Teachers** (3 hrs.) This is the first part of a two-part integrated methods and content course for elementary teachers. This part focuses on the "why" along with the "how" of such topics as problem solving, deductive and inductive reasoning, beginning number concepts, operations with whole numbers, elementary number theory and other appropriate topics such as learning theory and assessment. Prerequisites: Completion of the Tier I mathematics or Foundational math requirement in Breakthrough requirement with a C- or better. Offered every fall semester.

**MAT 305 Heart of Mathematics** (3 hrs.) A semester-long discussion of the big ideas of mathematics in cultural and applications contexts. Evolution of mathematical ideas in art, the sciences, computing, literature and other disciplines. An introduction to mathematical thinking and problem-solving in many contexts. Prerequisites: MAT 214 with a C- or better, or permission of instructor. Offered in the spring semester of even years.

**MAT 310 History of Mathematics** (3 hrs.) This course is taught from the viewpoint that mathematics has been a major cultural force in many civilizations. The course will trace the evolution of mathematics and its impact on the human endeavor as civilizations rose and fell throughout history to modern times. Prerequisites: Completion of MAT 124 with a C- or better. Offered in the fall semester of odd years.

**MAT 312 Differential Equations** (3 hrs.) A study of ordinary differential equations (ODEs). This course is focused on the analytical, geometrical, and numerical aspects of differential equations. First and second order ODEs are studied using various analytical techniques. The Laplace transform is utilized to solve initial value problems of higher-order ODEs. Particular attention is paid to systems of ODEs using phase portraits and numerical analyses. Offered spring semester of odd years. Prerequisites: Completion of CSC 104 and MAT 224 with a C- or better, or by permission of instructor.

**MAT 313 Mathematical Probability and Statistics** (3 hrs.) This course introduces the student to the mathematics of probability and statistics. The concepts of discrete and continuous probability distributions are studied in detail. The material is applied to the areas of statistical inference, including estimation and hypothesis testing. Offered every spring semester. Prerequisites: Completion of MAT 214 with a C- or better or concurrent enrollment in MAT 214.

**MAT 314 Higher Geometry** (3 hrs.) A study of various geometric axiomatic systems from both the synthetic and analytic approach, including finite and non-Euclidean geometries. Offered every fall semester or depending upon demand. Prerequisites: Completion of MAT 331 with a C- or better.

**MAT 321 Discrete Mathematics and Graph Theory** (3 hrs.) This course provides an introduction to an area of mathematics focusing on discrete rather than continuous mathematical structures. Topics explored in this course include number theory, functions and sequences, graph theory, combinatorics, and set theory. Basic definitions and concepts of the field as well as some major results in the area will be discussed. This course prepares students for further study in mathematics, business, or computer-related fields. Pre-requisite: MAT 214 with a grade of C- or better. Offered in even fall semesters.

**MAT 331 Mathematics Seminar** (3 hrs.) A study of the foundations of mathematics, logical deductive reasoning and proof. Emphasis is on sets and number theory. This course prepares the mathematics major for success in other 300- and 400-level mathematics courses. Prerequisites: Completion of CSC 104 with a C- or better; and MAT 224 with a C- or better or permission of the instructor. Offered every spring semester.

**MAT 340 Statistical Computer in R Studio** (3 hrs.) A projects-based introduction to R and R Studio with applications in relevant fields. The focus of this course is to work with pre-processed data and flat files, access and format large data from the web, analyze data by methods such as conditional means, regression analysis, and cross-validation techniques, with the focus on statistically analyzing and presenting the data.

**MAT 351 Methods of Teaching Elementary & Middle School Mathematics** (3 hrs.) This course is the second part of an integrated methods and content course for elementary teachers. Topics include fractions, decimals, geometry, probability and statistics, measurement and other appropriate topics. Offered every spring semester. Prerequisites: C- or better in MAT 231 or permission of the instructor.

**MAT 398 Independent Study** (1-4 hrs.) Individual study and/or research under the supervision of staff members on a particular topic agreed upon by both the student and the instructor. Enrollment by permission of the instructor and department chair.

**MAT 411 Data Science Seminar** (3 hrs.) This is a capstone course for majors. Each individual in the class carries out research under the supervision of the instructor in large-scale data analysis using statistical knowledge and computational techniques learned in previous courses. Literature review, regular meetings, progress reports, and a final paper and presentation are required. Topics may be chosen from interdisciplinary fields including, but not limited to, computer science, biology, psychology, engineering, and business. Offered every other spring semester. Prerequisites: MAT 340, ECN 355, and CSC 211 with a grade of C- or better.

**MAT 422 Modern Algebra** (3 hrs.) A study of the axiomatic development of algebraic structures, including groups, rings, and fields, with selected introductions to topics which may include symmetry groups, factorization, and integral domains. Offered every spring semester. Prerequisites: Completion of CSC 104 and MAT 331 with a C- or better.

**MAT 424 Advanced Calculus** (3 hrs.) This course is a rigorous study of the foundations of Calculus with emphasis on limits, continuity, differentiation, and Riemann integration. Through the reexamination of those topics, students learn proof techniques which are fundamental to the mathematical field of analysis. Prerequisites: Completion of CSC 104, MAT 331, and MAT 224 with grades of C- or better. Offered every fall semester.

# PHL – Philosophy

**PHL 101 Introduction to Philosophy Through Film** (3 hrs.) This course utilizes films and media to help explore the major areas of philosophy relating to who and what we are and how we should live our lives. More specifically, it explores questions relating to the belief in God; knowledge of the world; the relationship between minds, bodies, and persons; freedom and responsibility; and ethics and morality. Offered each semester

**PHL/REL 102 World Religions** (3 hrs.) One of the most pressing problems of the 21st century is religious pluralism: We live in a world, in a nation, and in an academic community that is religiously diverse. How will we relate to persons who are different from one another and from us in terms of religious orientation? Will we choose to relate in ways that are healthy or ways that are harmful? For unless we know what persons of faith believe and value and do, we cannot relate in positive ways to them. This course will strive to understand a number of the varied religious traditions of the world in a way that is fair, open-minded, objective, and kind. “Agreeing” with the various religions we will be studying is not required; however, “understanding” them is. Typically offered every semester.

**PHL 120 History of Philosophy** (3 hrs.) This course explores the history of western philosophy with an emphasis on the ancient, medieval and modern philosophical eras. Pursued chronologically, most attention is given to central figures such as Socrates, Plato, Aristotle, Aquinas, Descartes, Locke, Hume and Kant though a broader range will be investigated with an emphasis on their views relating to ethics, political theory, and metaphysics/epistemology (relating to the nature of reality and how we come to know such). The course also focuses on applying historical philosophical thought to our contemporary world.

**PHL 212 Introduction to Ethics** (3 hrs.) An introductory survey that begins with a brief introduction of ethical theory before moving on to explore specific applied ethical issues such as the following: abortion, euthanasia, sexual morality, human cloning, animal rights, war and terrorism, and distributive justice. The focus of the course is developing critical ethical reasoning that enables deeper normative insights in to how we should live our lives. Offered each spring.

**PHL 218 Introduction to Logic** (3 hrs.) Drawing from a broad spectrum of controversial issues, this course is a systematic introduction to techniques for constructing, analyzing, and evaluating arguments using ordinary language instead of formal systems of inference. Offered every other spring.

**PHL 242 Biomedical Ethics** (3 hrs.) The course begins with a brief introduction to ethical theories and to major moral principles used in analyzing problems in biomedical ethics. Theories and principles are then applied to a sampling of biomedical cases such as the following: severely impaired newborns and their parents’ right to refuse treatment for them; the justification for genetic manipulation and screening; physician-assisted suicide; doctor-patient confidentiality and informed consent; the use of fetal-cell tissues; living wills and their relationship to personal identity. The readings include analyses by physicians, jurists, and philosophers of the ethical and philosophical questions raised by the cases and issues considered.

**PHL 244 Business Ethics** (3 hrs.) A study of moral problems arising in business and industry: consumer rights, property rights and employee rights; the obligations of employees, owners and managers, governmental regulation and economic justice.

**PHL 246 Environmental Ethics** (3 hrs.) An examination of ethical issues arising from our use of natural resources, animate and inanimate, and different ethical perspectives regarding our relationship to the rest of the natural world (both now and in context of future generations). Most of the course is devoted to examining contemporary environmental issues (pollution, global warming, preservation of species, etc.) using traditional ethical theories, biocentric and ecocentric ethics, deep ecology, and concepts from economics and policy analysis. Offered every other spring semester.

**PHL 302 The Meaning of Life** (3 hrs.) What is the meaning of life? Most of us have asked this question of ourselves and perhaps of other people we respected. For, in addition to understanding the world in which we live, we want to make sense of how to make our own lives as meaningful as possible to know not only why we're living, but that we're living our lives with intention, purpose, and commitment. Through interesting and pertinent books, writing selections, films, and a community service/experiential learning project, this course will address this profound, abstract, and personal question. Prerequisite: One PHL or REL course, or permission of the instructors.

**PHL 320 Philosophy & Literature** (3 hrs.) This course examines philosophy, and particularly existentialist philosophy, through literature. We will focus on existentialist themes involving life's meaning, authenticity, freedom/responsibility, and identity as exemplified by the works of Dostoevsky, Kierkegaard, Nietzsche, Ortega, Heidegger, Sartre, de Beauvoir, and Camus. We will pursue these topics both through primary and secondary philosophical essays, and also through the literary works of such writers as Camus, Kundera, Barth, Crumey, and Hesse. Prerequisites: Any one of the following PHL 101, 212, 221, 222, 242, 244, 246; ENG 204, 205, 206, 238, 239, 248, 249; CLA 215; FRE 280; GER 204; LAT 204.

**PHL 324 Genetic Manipulation** (3 hrs.) This seminar provides an interdisciplinary examination of practices and policies relating to actual or imagined genetic manipulation of human beings and other life forms. We will discuss the history and practice of eugenics, the attempt to create “better” offspring, and its relationship to potential genetic technology. In part drawing from a Rawlsian framework we will discuss issues such as human cloning, genetic screening, and genetic manipulations of humans in light of principles such as justice, fairness, discrimination and other values such as the sanctity of life. We will also consider broader genetic manipulation of plants and animals and resulting ethical controversies from broadly scientific, ecological, philosophical and religious perspectives. Prerequisite: Any ONE of the following: Bio 114/115, BIO 328 BIO 124/125, BIO 100 General Biology I, PHL 101, 212, 221, 222, 242, 244, 246, or REL 101, 102.

**PHL 333 Asian Philosophy and Religion** (3 hrs.) The purpose of this course is to provide a detailed overview of the key thinkers and issues of the four major traditions of Eastern Philosophy: Indian, Chinese, Japanese, and Islamic. A variety of primary and secondary source readings are used to elucidate issues in metaphysics (including philosophy of religion), epistemology, ethics, political philosophy, and aesthetics. Prerequisite: Any ASN, PHL or REL course.

**PHL/REL 342 Philosophy, Religion, and Science (3 hrs.)** The common perception today is that, for centuries, science and religion have stood in conflict with each other—e.g. as demonstrated by conflicting perspectives between Charles Darwin and the Bible concerning the theory of evolution. Philosophy itself was foundational to scientific inquiry, though its approach differs from both science and religion and can also be seen by some as adversarial to each. This course explores three themes—cosmology and creation, evolution and providence, and genetics and human nature—from the vantage points of philosophy, religion, and science with the goal of presenting a fresh conversation between these fields which does not reduce to adversarial positions. Prerequisite: One course in philosophy or religious studies or one course in the natural sciences, or permission of the instructor.

**PHL 398 Independent Study** (1-4 hrs.) This course permits advanced study of topics not covered in regularly offered courses on a research-tutorial basis. The topic is defined by the student in conference with the instructor. Prerequisite: two previous courses in philosophy, a major or minor in philosophy, and permission of instructor.

**PHL 410 Major Areas of Philosophy** (3 hrs.) An intensive study of a major area of philosophy such as philosophy of religion, Eastern philosophy, ethics, metaphysics, epistemology, or philosophy of mind. May be repeated for credit with change of topic. Prerequisite varies depending on course.

**PHL 420 Major Philosophers** (3 hrs.) An intensive study of the thought of a single major philosopher such as Plato, Aristotle, Hume, or Kant. May be repeated for credit with change of topic. Prerequisite varies depending on course.

**PHL 430 Philosophical Problems** (3 hrs.) An intensive study of a relatively specific philosophical problem such as evolution vs. Intelligent Designer Theory, genetic manipulation (relating to human cloning/ eugenics), the mind-body problem, animal rights, philosophy of death and dying. May be repeated for credit with change of topic. Prerequisite varies depending on course.

## **REL – Religion**

**REL 101 Introduction to the Bible** (3 hrs.) Examines the historical context in which the Bible (including both the Hebrew Bible, Old Testament, and the New Testament) was written, the various types of literature found in the Bible and the important impact of the Bible on the Western cultural tradition. Some attention will be given to the questions of the Bible's relevance in addressing contemporary ethical issues. Typically offered every semester."

**REL/PHL 102 World Religions** (3 hrs.) One of the most pressing problems of the 21st century is religious pluralism: We live in a world, in a nation, and in an academic community that is religiously diverse. How will we relate to persons who are different from one another and from us in terms of religious orientation? Will we choose to relate in ways that are healthy or ways that are harmful? For unless we know what persons of faith believe and value and do, we cannot relate in positive ways to them. This course will strive to understand a number of the varied religious traditions of the world in a way that is fair, open-minded, objective, and kind. "Agreeing" with the various religions we will be studying is not required; however, "understanding" them is. Typically offered every semester.

**REL 302 The Meaning of Life** (3 hrs.) What is the meaning of life? Most of us have asked this question of ourselves and perhaps of other people we respected. For, in addition to understanding the world in which we live, we want to make sense of how to make our own lives as meaningful as possible—to know not only why we're living, but that we're living our lives with intention, purpose, and commitment. Through interesting and pertinent books, writing selections, films, and a community service/experiential learning project, this course will address this profound, abstract, and personal question. Prerequisite: One PHL or REL course, or permission of the instructors.

**REL 305 Perceptions of Death** (3 hrs.) No matter our gender, race, nationality, socio-economic status, and religious commitment, all of us shall one day die. And by whatever term it is referred—passing away, dying, croaking, giving up the ghost, passing, becoming fertilizer, succumbing to physical finitude, falling asleep (the euphemism in the time of Jesus)—not one of us shall be able to avoid death. Of course, death especially in Western, American culture, is not often discussed: Death is counter-cultural in that our society—with its obsession with youth, the new, and vitality—either dismisses death as an event that happens to someone else or denies death as an inevitable reality by emphasizing a false sense of personal earthly immortality. This interdisciplinary course will study the phenomenon of death in its biological, psychological, social, cultural, ethical, and religious dimensions. Topics will include the problem of defining death; the fear and denial of death; the institutionalization and secularization of death in the modern world; the dying person and the process of death; grief; funerals; suicide; beliefs concerning life after death; literary treatments of death; and ethical issues surrounding death (such as the artificial prolongation of life, euthanasia, capital punishment, cloning, and genocide). Typically offered every other year. Prerequisites: 3 hours of Religious Studies credit or permission of instructor.

**REL 307 Social Justice in Modern Christian Thought** (3 hrs.) With a focus on social ethics, this course will explore the moral implications of the Christian commitment, the formulation and development of the principles of Christian ethics for persons and within communities, and their applications to areas of contemporary life. The course will address issues such as economic justice, poverty and wealth, criminal justice and capital punishment, war and pacifism, as well as environmentalism and food consumption. We will give attention to Catholic Social Teaching, Liberation Theology, and Anabaptist thought, among others. Typically offered once every year. Prerequisites: REL 101 or REL 102.

**REL 316 The Teachings of Jesus** (3 hrs.) The emphasis of this course is upon developing a historical understanding of Jesus. The teachings of Jesus are examined, using the Biblical Gospels, parallel Jewish and Greek and Roman documents and early extra biblical Christian texts as source materials. Attention will be given to the interpretation of Jesus in the Gospels, Paul and other early Christian sources. Interpretations of Jesus throughout history and in the contemporary world which shape the reception history of the "teachings of Jesus" will be studied. Typically offered every other year. Prerequisites: REL 101.

**REL 319 Recent Christian Thought** (3 hrs.) An introduction to major themes, writers and movements in contemporary Christian theology, against the background of an historical overview of the development of Christian thought. Typically offered once every three-four years. Prerequisites: 3 hours of Religious Studies credit.

**REL 333 Asian Philosophy and Religion** (3 hrs.) The purpose of this course is to provide a detailed overview of the key thinkers and issues of the four major traditions of Eastern Philosophy: Indian, Chinese, Japanese, and Islamic. A variety of primary and secondary source readings are used to elucidate issues in metaphysics (including philosophy of religion), epistemology, ethics, political philosophy, and aesthetics. Prerequisite: Any ASN, PHL or REL course.

**REL 335 Sex and Gender in the Christian Tradition** (3 hrs.) This course is a critical study of sexuality and gender within the Christian tradition. Using biblical perspectives, theological positions, ethical reasoning, church traditions, faith commitments and empirical data as our guides, we will explore several realms of contemporary Christian conversation. Lenses for interpretation used within the course include Womanist ethics, Queer theory and theology, and Feminist biblical exegesis. It examines key ethical variables such as human nature, God, the church, love, justice and empowerment in such major issues of sexuality and gender as human eroticism, marriage, partnering, divorce, contraception, reproduction, sexual identity and sexual violence. Typically offered every other year. Prerequisites: 3 hours of credit in REL or WGS.

**REL/PHL 342 Philosophy, Religion, and Science** (3 hrs.) The common perception today is that, for centuries, science and religion have stood in conflict with each other – e.g. as demonstrated by conflicting perspectives between Charles Darwin and the Bible concerning the theory of evolution. Philosophy itself was foundational to scientific inquiry, though its approach differs from both science and religion and can also be seen by some as adversarial to each. This course explores three themes--cosmology and creation, evolution and providence, and genetics and human nature—from the vantage points of philosophy, religion, and science with the goal of presenting a fresh conversation between these fields which does not reduce to adversarial positions. Prerequisite: One course in philosophy or religious studies or one course in the natural sciences, or permission of the instructor.

**REL 345 The Writings of C.S. Lewis** (3 hrs.) C.S. Lewis has been long recognized as one of the premier theologians and writers of the twentieth century. This course will examine Lewis' theology through the lens of his works of fiction, emphasizing religious themes such as the nature of belief, the problem of evil, temptation, conversion, and death. (Previously offered as PHL 410/REL 300).

**REL 346 / GTS 300 Religion and Violence** (3 hrs.) The Holocaust and Other Genocides: This course will investigate a number of large-scale outbreaks of violence among humans in the 20th and 21st centuries. The Holocaust will be studied first, and will then be used as a springboard to examine other genocides or atrocities.

**REL 398 Independent Studies in Religion** (1-4 hrs.) This course permits advanced study of areas in religion not covered by regular listings on a research-tutorial basis. The precise topic is defined by the student in conference with the instructor. Offered as needed. Prerequisites: six hours of religion and permission of the instructor.