



## **EXERCISE SCIENCE MAJOR**

Assistant Professor: A. Gowin (Chair)

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Exercise Science majors will explore the science of exercise and its role in health, fitness, and optimal sports performance. Students will prepare for graduate programs, health careers such as athletic training, physical therapy, physician's assistant, nursing, and medicine. The major will include a capstone research or internship experience tailored to the student's career goals. Students are encouraged to obtain professional certifications, such as ACSM Personal Trainer or Health/Fitness Instructor certification, as appropriate.

A grade of C- or better is required in all courses used to satisfy the major requirements.

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](#)
- [Health and Exercise Science Course Descriptions](#)
- [Physical Education Course Descriptions](#)

**Major: EXERCISE SCIENCE**

Student's Last Name

First Name

Middle Initial

Advisor

Date Major Declared

Course #	Title of Course	Hours Required	Semester Completed	Grade
<b>Required Courses:</b>				
HES 101	Introduction to Exercise Science	1		
BIO 114/115	Biological Processes	4		
BIO 124/125	Biodiversity	4		
BIO 302	Human Anatomy*	4		
BIO 420	Physiology (BIO 302 or 322 prereq)	4		
CHM 114/115	Chemistry I	4		
CHM 124/125	Chemistry II	4		
HES/PSY 231	Sports Psychology	3		
HES 232	Care and Prevention of Athletic Injuries	3		
HES 251	Introduction to Nutrition	3		
HES 321	Kinesiology	3		
HES 340	Exercise Physiology	3		
HES 342	Exercise Prescription	3		
	Capstone Research or Field Experience in Exercise Science	3		
	<b>TOTAL HOURS FOR MAJOR</b>	<b>46 hrs.</b>		
<b>Optional Courses:</b>				
HES 215	Motor Learning	3		
HES 350	Theories of Adapted Physical Education	3		
HES 406	Management in PE & Athletics	2		
*Students who need extra preparation for BIO 302, Human Anatomy are advised to take NSC 210, Anatomy and Physiology I.				
A grade of C- or better is required in all courses used to satisfy the major requirements				

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.

## 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.

## **PED – Physical Education**

**PED A9 Racquet Sports** (1 hr.) Students will learn the skills, rules, terms, scoring, and etiquette involved in a variety of racquet sports. Badminton, paddleball, racquetball, and table tennis included.



**PED A10 Weight Training & Body Building** (1 hr.) In this course the student will learn proper weight training techniques for a lifetime goal of health and wellness.

**PED A12 Walking and Jogging for Fitness** (1 hr.) This activity class is designed to provide students an understanding and working knowledge of the role of walking and jogging as a fitness alternative and health aid.

**PED A13 Restrictive/Adaptive PE** (1 hr.) Students with special needs will develop and practice a physical education and activity program that is individualized to their specific needs.

**PED A15 Yoga** (1 hr.) Students will learn some basic poses of Hatha Yoga for relieving stress, increasing flexibility, improving posture and breathing, and increasing strength. This is an introductory course, although students with previous yoga experience will also benefit.

**PED A19 Golf Instruction (Fee)** (1 hr.) Students will learn proper golf techniques, which will provide a foundation for a lifetime enjoyment of the sport. Course fee required.

**PED A22 Physical Fitness Concepts** (1 hr.) Student's baseline fitness values are assessed, fitness principles are learned, and training and behavioral strategies are developed through in-class activities. Physical Education Majors will take this course concurrently with Wellness Concepts (HES 132) to meet state requirements for 2 hrs. of health-related fitness and wellness. Majors cannot use this course for Activity Competency in Physical Fitness too.

**PED A37 Tennis** (1 hr.) This course will provide students with the opportunity to review basic tennis skills through participation in drills, actual game play and mini tournaments. Individual stroke analysis will also be given. For students that have the basics down, higher level instruction on singles and doubles.

**PED A44 Recreational Games I: Team Sports** (1 hr.) Students learn fundamental skills and techniques of basketball, field hockey, soccer, softball and volleyball. Course emphasis is on demonstration in teaching/coaching situations.

**PED A45 Recreational Games II: Individual Sports** (1 hr.) Students learn fundamental techniques and skills for individual sports with emphasis on demonstration for teaching and coaching.

**PED A53 Bowling** (1 hr.) In this course the students will learn the rules of the game, including score keeping, the foul line, and the equipment restrictions, will learn the basic motor skills necessary to bowl, and learn the basic bowling etiquette. Course fee required.

**PED 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.

**PED 311 Coaching Theory of Football** (2 hrs.) The analysis of football strategies and coaching techniques applied with variation. Prerequisites: knowledge and skill in the sport.

**PED 312 Coaching Theory of Soccer** (2 hrs.) The analysis of soccer strategies and coaching techniques applied with variation. Prerequisites: knowledge and skill in the sport.

**PED 313 Coaching Theory of Baseball** (2 hrs.) The analysis of baseball strategies and coaching techniques applied with variation. Prerequisites: knowledge and skill in the sport.

**PED 314 Coaching Theory of Basketball** (2 hrs.) The analysis of basketball strategies and coaching techniques applied with variation. Offered in fall semesters of odd numbered years. Prerequisites: knowledge and skill in the sport.

**PED 317 Coaching Theory of Volleyball** (2 hrs.) The analysis of volleyball strategies and coaching techniques applied with variation. Offered fall semesters of even numbered years. Prerequisites: knowledge and skill in the sport.

**PED 318 Coaching Theory of Softball** (2 hrs.) The analysis of softball strategies and coaching techniques applied with variation. Offered in spring semester of odd numbered years. Prerequisites: knowledge and skill in the sport.

**PED 319 Coaching Theory of Tennis** (2 hrs.) The analysis of tennis strategies and coaching techniques applied with variation. Offered in spring semester of even numbered years. Prerequisites: knowledge and skill in the sport.

**PED 331 Sports Officiating: Football** (1 hr.) Designed for the development of expertise in officiating. Certification optional to student. Laboratory required.

**PED 332 Sports Officiating: Soccer** (1 hr.) Designed for the development of expertise in officiating. Certification optional to student. Laboratory required.

**PED 333 Sports Officiating: Baseball** (1 hr.) Designed for the development of expertise in officiating. Certification optional to student. Laboratory required.

**PED 334 Sports Officiating: Basketball** (1 hr.) Designed for the development of expertise in officiating. Certification optional to student. Laboratory required.

**PED 337 Sports Officiating: Volleyball** (1 hr.) Designed for the development of expertise in officiating. Certification optional to student. Laboratory required.

**PED 338 Sports Officiating: Softball** (1 hr.) Designed for the development of expertise in officiating. Certification optional to student. Laboratory required.



**PED 434 Methods of Teaching Middle School and Secondary Physical Education** (3 hrs.) This course is designed for students planning to teach middle school and secondary physical education programs. Topics include program development, selecting and implementing instructional units, class organization and management, assessment, integrating physical education with other disciplines, and professional development. Prerequisite: EDU 290.