

# Exercise Science (EXSC)

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## Courses

### **EXSC-210. Group Exercise Instructor. 3 Hours.**

In this course students will learn how to design resistance and cardiovascular training programs based on periodization principles that are specific to group exercise classes. Successful completion of this course will allow students to sit for the exam to become a Certified Group Exercise Instructor.

### **EXSC-215. Resistance & Cardiovascular Training For Health & Fitness. 3 Hours.**

In this course students will learn how to design a resistance and cardiovascular training program based on periodization principles that are specific to an individual. Successful completion of this course will allow students to sit for the exam to become a Certified Personal Trainer.

### **EXSC-304. Testing And Prescription For Health And Fitness. 3 Hours.**

This course focuses on the physiological rationale for health-related fitness tests (i.e., cardiorespiratory endurance, muscular strength/endurance, muscular flexibility, and body composition) and covers the procedures for utilizing the information collected from these tests. The course also provides laboratory and field experiences on how to conduct and evaluate health-related fitness tests.

**Prerequisite:** PEMT-306 with a minimum grade of C.

### **EXSC-315. Design Of Specific Exercise Programs. 3 Hours.**

In this course students will learn how to design a resistance and cardiovascular training program based on periodization principles that are specific to an individual or sport. Successful completion of this course will allow students to sit for the exam to become a Certified Strength and Conditioning Specialist.

**Prerequisite:** EXSC-215 with a minimum grade of C.

### **EXSC-350. Independent Study Exercise Science. 3 Hours.**

In this course the instructor will work with the student to develop classroom materials as well as field experiences that are directly related to the students' future career interests. This course is taken in the students' final semester and needs departmental approval to enroll in it.

**Requirement:** Departmental Approval.

### **EXSC-403. Research Methods In Exercise Science, Physical Education, Sport, And Recreation Settings. 3 Hours.**

This course provides an introduction to the types of research methods and design utilized in exercise science, physical education, sport, and recreation settings. Students will learn how to read and interpret peer-reviewed literature and use that literature to develop a research proposal.

### **EXSC-404. Exercise Testing And Prescription. 3 Hours.**

The laboratory component of the course provides instruction and experience in the performance of laboratory and field tests for the measurement of variables needed to evaluate the health-related fitness components (i.e., cardiorespiratory endurance, muscular strength/endurance, muscular flexibility, and body composition). The lecture component of the course focuses on the physiological rationale for these tests and covers the procedures for utilizing the information collected in laboratory and field testing. Specifically, students will be instructed on the evaluation the health-related fitness status of tested individuals and on the prescription of exercise training regimens for health-related fitness status alteration and physical performance enhancement. An equipment fee of \$125 is required.

### **EXSC-405. Applied Nutrition. 3 Hours.**

The course provides instruction in macronutrient requirements at rest and during exercise, energy balance for body composition alteration or maintenance (i.e., obesity prevention), fluid and electrolyte balance during exercise, and the vitamin/mineral concerns associated with exercise and performance. Additionally, the course will consider the preventative role of nutrition in various disease states including cardiovascular disease, degenerative bone disease, and diabetes.

### **EXSC-413. Development And Management Of Physical Education, Recreation, And Sport Programs. 3 Hours.**

The course provides instruction on the development and management of physical education, recreation, and sport programs in schools, universities, corporations, and recreational facilities. Specifically, an overview and the underlying principles of operating facilities, sales/marketing strategies, member/ staff recruitment, management practices, equipment purchase/ maintenance, health/ safety considerations, financial management, legal issues, and insurance considerations will be discussed.

### **EXSC-414. Program Development And Management In Health Promotion. 3 Hours.**

The course provides instruction in the area of organizational development and management in the health promotion field. Specifically, the procedures for needs assessment, planning, implementation, resource identification/ allocation, marketing and evaluation for health promotion programs will be discussed.

### **EXSC-415. Exercise Management In Chronic Diseases And Disabilities. 3 Hours.**

The course expands on the exercise testing and prescription information covered in EXSC-404 to include special population with chronic disease and/or disabilities. The course provides a pathophysiological overview of various cardiovascular, pulmonary, metabolic, immunological/hematological, orthopedic, neuromuscular, cognitive, emotional and sensory disorders. A major portion of the course deals with exercise management in people with these disease/ disabilities and, in particular, instruction on the special exercise testing and prescription considerations for these populations (e.g., abnormal exercise response potential, exercise interaction with commonly prescribed medication, etc.).

**Prerequisite:** EXSC-404 with a minimum grade of D.

**EXSC-416. Practices In Cardiac Rehabilitation. 3 Hours.**

The course provides the student with a concise and comprehensive overview of the research and currently accepted professional practice in the fields of heart disease primary prevention and cardiac rehabilitation. Specifically, the epidemiology, pathophysiology, diagnosis and treatment of heart disease will be discussed. Included in these discussions will be the diagnostic and prognostic use of exercise testing in cardiac patients. Additionally, a significant portion of the course will cover cardiovascular disease risk factor modification and the rehabilitation cardiac patients, including exercise prescription guidelines for this special population.

**Prerequisite:** EXSC-404 with a minimum grade of D.

**EXSC-418. Current Topics In Exercise And Sport Science. 3 Hours.**

The course provides students with the opportunity to explore the current research in the various areas that encompass the Exercise Sciences. Additionally, students are provided with a venue in which to discuss, with their peers and their professors, these topics salient to their professional growth and development. Understanding of these current topics is evaluated through the students' written reviews, oral presentations, and participation in class discussions of the presented reviews.

**EXSC-419. Psychology Of Exercise & Health Behaviors. 3 Hours.**

Research and psychological theories are examined in relation to Exercise and Physical activity behaviors across the lifespan; Psychological responses to exercise, sport and physical activity are examined in relation to behavior change and adherence. Students learn how to develop psychological interventions for increasing exercise participation and adherence.

**EXSC-420. Prevention Of Chronic Disease Through Diet & Exercise. 3 Hours.**

The course covers the molecular and cellular basis of prevention of chronic diseases. The emphasis is on the biological mechanisms of the causes of chronic diseases and on how dietary components and repeated stressful exercise alter the mechanisms of cause to reduce risk for these diseases. The major topics include: inflammation, obesity, metabolic syndrome and diabetes, atherosclerosis, and cancer.

**EXSC-421. Motor Control And Learning. 3 Hours.**

The course provides instruction in how humans control locomotion and how they learn/re-learn motor skills. Specifically, the course emphasizes the observable behavioral aspects of motor control/learning while detailing the neurophysiological and biomechanical processes that result in the aforementioned motor behaviors.

**EXSC-422. Biomechanics. 3 Hours.**

The course provides instruction in how the interaction between anatomy, physiology, and the laws of physics affect and control human movement and performance. Specifically, the biomechanical of work and energy, balance and movement control, force load and force production, and fatigue during exercise and performance will be discussed.

**EXSC-427. Adapted Physical Education, Recreation, And Sport Programs. 3 Hours.**

The course provides instruction on the history, current status, and future directions of adapted physical education, recreation, and sport programs within our society. The course will include discussions on the psychosocial and medical issues that must be considered when working with individuals with disabilities. Students will learn about existing sports, sport modifications, participation opportunities, and participation barriers for individuals with performance-altering impairments. Field work and visits to various agencies included in these programs.

**EXSC-430. Internship. 3 Hours.**

The course provides students the opportunity to gain practical exercise science (e.g., fitness, wellness, or human performance) career experience in corporate, commercial, institutional, community, educational, rehabilitative or research settings.

**EXSC-431. Independent Study/Research. 3 Hours.**

The course affords students the opportunity to conduct an independent experimental, descriptive, analytical or qualitative research project within the exercise sciences. The credit hours can also be used for faculty-monitored learning of advanced laboratory methodology not covered in the current curriculum. Planning of the proposed research project or independent study must be supervised and approved by an EXSC faculty member prior to course enrollment approval. Submission of a written report of the completed research project or independent study will be required for all students.

**Prerequisite:** EXSC-403 with a minimum grade of D.

**EXSC-433. Rehabilitation And Performance Injuries. 3 Hours.**

The course provides instruction in the prevention, management, and rehabilitation of performance injuries. The topics discussed include an overview of the prevention and care of injury, techniques for injury risk management, the pathology of injury, various injury management skills (e.g., psychosocial intervention, injury evaluation/emergency care, therapeutic modalities, and exercise rehabilitation), and an overview of the evaluation, care, and rehabilitation of various specific performance-related injuries.

**EXSC-434. Physiology Of Aging And Physical Activity. 3 Hours.**

The course provides instruction in the theories of the aging process and the age-related changes in the functioning of various physiological systems. Specifically, the age-related changes in bioenergetics, work capacity/ efficiency, cardiopulmonary function, muscular strength, endurance, motor control, motor performance, and psychosocial functioning, among other variables are discussed. Additionally, the potential role of physical activity and exercise in the alteration of these age-related changes, quality of life indices, functional capacity, and productivity in the elderly will be presented.

**Prerequisite:** EXSC-402 with a minimum grade of D.

**EXSC-435. Theory & Methodology Of Coaching. 3 Hours.**

The course provides instruction on the theories and methodologies of sport coaching. Specific emphasis will be placed on the planning, implementation and assessment aspects of coaching, including the philosophical foundations of coaching, technical and tactical coaching principles and player assessment strategies.

**EXSC-442. Sports-Specific Exercise Training. 3 Hours.**

This course integrates the cellular basis of performance enhancement with the components of fitness and of skill enhancement to develop an integrated and applied-science approach to exercise training for: the maximum-performance/moderate-skill sports of sprint & long-distance running, cycling, and swimming; the high-level fitness/high-skill sports of gymnastics, hockey, and soccer, and to the lower-level fitness/high-skill sports of basketball, football, and golf.

**EXSC-444. Cellular Physiology Of Exercise. 3 Hours.**

The course provides instruction in the bioenergetics of human movement. Specifically, cellular metabolism and its neuroendocrine control, at rest and in response to both acute and chronic exercise, will be discussed. Additionally, the processes and control of transcription, protein synthesis, and protein degradation will be covered.

**EXSC-445. Cardiovascular & Respiratory Physiology Of Exercise. 3 Hours.**

The course provides advanced instruction in the functioning of the respiratory, cardiovascular and skeletal muscular systems at rest and during exercise. Specifically, the course will provide instruction in pulmonary ventilation, myocardial functioning, circulatory response and skeletal muscle contraction, as well as neuroendocrine control of these processes, at rest and during exercise. Additionally, the exercise-specific application of these physiological processes will be discussed in reference to strength/endurance exercise training adaptations, neuro-muscular fatigue, ergogenic aids (i.e., human performance enhancement substances), gender-related performance differences, and youth exercise/performance.

**EXSC-5901. Thesis Hours. 1 Hour.**

For those students selecting the Thesis Option for the Master of Science in Exercise and Sport Science degree, the course provides faculty guidance in the areas of research question development, research design, data analyses, data interpretation, written research presentation and oral research presentation.

**EXSC-5902. Thesis Hours. 2 Hours.**

For those students selecting the Thesis Option for the Master of Science in Exercise and Sport Science degree, the course provides faculty guidance in the areas of research question development, research design, data analyses, data interpretation, written research presentation and oral research presentation.

**EXSC-5903. Thesis Hours. 3 Hours.**

For those students selecting the Thesis Option for the Master of Science in Exercise and Sport Science degree, the course provides faculty guidance in the areas of research question development, research design, data analyses, data interpretation, written research presentation and oral research presentation.