

# *Cardiopulmonary and Exercise Science (EXSC)*

## **Courses**

### **EXSC 1120. Introduction to Exercise, Fitness, and Health. (4 Hours)**

Explores the fundamental role of exercise and fitness in health. Introduces principles of exercise and various components of fitness and wellness. Discusses the development of basic exercise prescription for cardiorespiratory endurance, muscular strength, and endurance and flexibility and provides hands-on experiences of measuring these components. Includes discussions on a wide range of topics, including advances and innovations in health and fitness and practices that lead to more healthful living.

### **EXSC 2991. Research in Exercise Science. (1-4 Hours)**

Offers an opportunity to conduct introductory-level research or creative endeavors under faculty supervision.

### **EXSC 4500. Exercise Physiology 1. (4 Hours)**

Introduces exercise physiology. Covers the muscular, neuromuscular, cardiovascular, ventilatory, endocrine, and metabolic responses to acute exercise and the physiological adaptations to chronic exercise and physical activity. Basic concepts related to physical fitness, body composition, weight control, and training principles are discussed.

### **EXSC 4501. Lab for EXSC 4500. (1 Hour)**

Accompanies EXSC 4500. Offers experiments in the exercise physiology laboratory that introduce concepts related to the lecture content of the course and include techniques such as strength testing, ergometry, graded exercise testing, indirect calorimetry, and body composition assessment.

### **EXSC 4990. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

### **EXSC 5200. Cardiopulmonary Physiology. (3 Hours)**

Offers students an opportunity to gain an understanding of physiological principles of the cardiopulmonary system. This advanced course covers (1) the structure and functional operation and regulation of the cardiopulmonary system; (2) disease-associated physiological changes and cardiopulmonary dysfunction; (3) exercise-induced acute responses and physiological adaptations of the system and their applications to chronic cardiopulmonary diseases. Encourages students to integrate their knowledge of exercise and physical activity with cardiopulmonary health and fitness, as well as cardiopulmonary disease prevention and treatment. Restricted to graduate students in exercise science and undergraduate students minoring in exercise science.

**Prerequisite(s):** EXSC 4500 with a minimum grade of D- or graduate program admission

### **EXSC 5210. Physical Activity and Exercise: Prescription, Measurement, and Testing. (3 Hours)**

Studies the general principles of physical activity and exercise prescription, measurement, and testing. Offers students an opportunity to learn the fundamental concepts and techniques to measure physical activity, exercise, and related testing procedures through a hands-on approach. Topics include the use of questionnaires and activity monitors to measure physical activity; measurement of body composition, fitness, muscular strength, and endurance; and clinical exercise testing. The fundamental concepts of exercise prescription and use of measurement techniques taught in this course are applicable to careers in physical therapy, exercise physiology, and as a physician assistant. Requires prior completion of EXSC 4500 or equivalent undergraduate course or permission of instructor.

### **EXSC 5220. Advanced Exercise Physiology. (3 Hours)**

Covers the advanced study of concepts, principles, and research in the field of exercise physiology. Discusses advanced concepts in the muscular/neuromuscular, cardiovascular, ventilatory, endocrine, and metabolic responses to exercise and exercise training. Specific study of the physiological control mechanisms regulating these systems are also addressed during periods of rest, acute exercise, and following chronic exercise training.

**Prerequisite(s):** EXSC 4500 with a minimum grade of D- or graduate program admission

### **EXSC 5230. Physical Activity and Exercise: Effects on Musculoskeletal Health and Disease. (3 Hours)**

Seeks to provide a foundation for understanding the benefits of physical activity and exercise and the detrimental effects of physical inactivity and sedentary behavior on musculoskeletal health. Studies the function/dysfunction of the musculoskeletal systems resulting in common/uncommon disorders and the prevalence, etiology, and benefits of physical activity/exercise. Students apply previously learned exercise physiology principles, such as exercise prescription and neural and motor control adaptations, to physical activity and exercise. Discusses key physiological mechanisms underlying common/uncommon musculoskeletal disorders. Examines the preventive and beneficial effects of physical activity and exercise endorsed by the American College of Sports Medicine. Restricted to graduate students in exercise science and to undergraduate students minoring in exercise science.

**Prerequisite(s):** EXSC 4500 with a minimum grade of D- or graduate program admission

**EXSC 5240. Clinical Nutrition Applications in Health and Disease. (3,4 Hours)**

Prepares health professionals to effectively communicate principles of diet and nutrition to their clients and the public. Covers public health promotion strategies, techniques used to teach diet and nutrition, and behavioral theories used in diet and nutrition intervention. Emphasizes clinical applications for the treatment of weight disorders, diabetes, cardiovascular disease, eating disorders, and nutrition in the life cycle.

**EXSC 5976. Directed Study. (1-4 Hours)**

Offers independent course work under the direction of members of the department on chosen topics. Requires submission of a written proposal to the program adviser prior to the intended semester. May be repeated without limit.

**EXSC 6202. Electrocardiography, Clinical Assessment, and Prescription. (3 Hours)**

Focuses on the identification and management of chronic diseases. Offers students an opportunity to learn skills to interpret EKGs. Topics include cardiac electrophysiology, lead systems, dysrhythmia recognition and treatment, axis, infarction, ischemia, hypertrophy, and the effects of cardiovascular drugs and exercise on the EKG. Through case studies, students interpret exercise test results, prescribe exercise, and evaluate exercise programs for clinical conditions such as cardiovascular disease, pulmonary conditions, and metabolic diseases.

**EXSC 6300. Internship in Exercise Science. (3 Hours)**

Offers students an opportunity to obtain practical experience and to synthesize, integrate, and apply skills and knowledge learned in the exercise science curriculum in a professional environment. Field experiences are an important part of graduate education programs in exercise science. The student is expected to complete a minimum of 300 hours of supervised experience in a research or practice setting. May be repeated once.

**Prerequisite(s):** (EXSC 5200 with a minimum grade of D- or EXSC 5200 with a minimum grade of C- (Graduate)); (EXSC 5210 with a minimum grade of D- or EXSC 5210 with a minimum grade of C- (Graduate)); (EXSC 5220 with a minimum grade of D- or EXSC 5220 with a minimum grade of C- (Graduate))

**EXSC 6400. Applied Research Methods. (3 Hours)**

Studies how to conduct scientific research in exercise science. Offers students an opportunity to propose a research project and design appropriate methodology to complete the project. Includes discussions on developing research hypotheses, comparing study designs, selecting appropriate statistical analyses, and managing data collection. Incorporates interpretation of published research to support the proposed research. Students present their own research plans through scientific writing.

**EXSC 6962. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

**EXSC 6966. Practicum. (1-4 Hours)**

Provides eligible students with an opportunity for practical experience.

**EXSC 7990. Thesis 1. (3 Hours)**

Provides initiation to scholarly investigation. Requires students to submit a written research proposal, which includes the first three chapters of the thesis (introduction, review of literature, and methods and procedures) for approval by a thesis committee and to present an oral proposal at a seminar. May be repeated once.

**EXSC 7991. Thesis 2. (3 Hours)**

Continues EXSC 7990.

**Prerequisite(s):** EXSC 7990 with a minimum grade of C-