

Exercise Science

Courses

EXSC 5086. Problems. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 1-6 Hours).

Directed study of selected problems in Exercise Science.

EXSC 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).

Students are required to successfully complete a thesis under the direction and supervision of their thesis chair and committee members. The thesis will require a minimum of two semesters of work and possibly more depending upon their topic and design, thus students will be allowed to register for three hours each semester. The thesis option is designed for students that want to gain extensive experience in research and/or greater knowledge about a specific topic area. It is also designed for those that anticipate more advanced research (e.g., Ph.D.). Upon completion of their work there is a thesis defense. This course is scheduled when the student begins the thesis. No credit is given until the thesis is completed. Thesis hours only count toward the degree if and only if the thesis is complete and approved by the committee and the College of Graduate Studies. Prerequisite: HLSC 5330.

EXSC 5301. Readings in Exercise Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

This course focuses on developing critical literacy skills to evaluate, interpret, and synthesize research literature. Students will explore key topics in exercise science, analyze research methodologies, and apply findings to practical and professional contexts while enhancing their ability to effectively communicate insights.

EXSC 5303. Research in Exercise Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

This course is designed to equip students with the skills to design and conduct ethical research, critically analyze scientific literature, and apply advanced statistical methods to data interpretation. Emphasis is placed on translating research findings into practical applications and communicating results effectively within academic and professional contexts.

EXSC 5320. Exercise Physiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).

This course will examine the physiological mechanisms underlying human performance and adaptation to exercise. Emphasis is placed on integrating research, applying advanced laboratory techniques, and analyzing the effects of environmental, nutritional, and training factors on exercise outcomes.

EXSC 5322. Environmental Exercise Physiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

This course explores the physiological responses and adaptations to exercise in extreme and diverse environmental conditions. Students will examine the effects of heat, cold, altitude, humidity, pollution, and microgravity on human performance, thermoregulation, cardiovascular function, and metabolism. The course integrates current research, applied case studies, and real-world considerations for athletes, military personnel, and occupational workers. Through laboratory experiences and critical discussions, students will develop strategies for optimizing performance and mitigating risks associated with environmental stressors.

EXSC 5325. Exercise Prescription Through the Lifespan. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).

Exercise Prescription Through the Lifespan provides an in-depth exploration of designing and implementing exercise programs tailored to the unique needs of individuals at different life stages. Emphasizing evidence-based practice, students will analyze physiological changes, address chronic conditions, and adapt interventions to promote health, fitness, and performance across diverse populations. Practical application and client education strategies are integral components of this course.

EXSC 5328. Adapted Exercise and Sport. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

A study of muscle re-education and the application of exercise to orthopedic, muscular, and neurological disorders. Principles of planning and directing adapted and therapeutic exercise and sport programs.

EXSC 5333. Theory of Exercise Programming and Evaluation. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).

This course is designed to teach students how to apply various theories of training and periodization, to aid in appropriately designing exercise programs. Additionally, students will learn to use modern technologies to track and evaluate athlete/client progress, leading to informed decisions for subsequent programming of exercise.

EXSC 5335. Laboratory and Research Techniques in Exercise Science. 3 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).

This laboratory-based course is designed to provide students with a basic understanding of selected research methods used in the quantitative assessment of health, exercise tolerance, muscle metabolism, and training adaptations. Specifically, exercise physiology tests and procedures, laboratory guidelines, and supervision. Emphasis on choice and implementation of proper procedures; calibration; operation and maintenance of exercise physiology equipment. In addition, we will discuss decision making regarding test selection, data collection and organization procedures, and interpretation and reporting of exercise test results.

EXSC 5336. Statistics in Exercise Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

Statistics in Exercise Science provides students with a deep understanding of statistical principles and techniques crucial for conducting and interpreting research in the field of exercise science. Students will learn how to apply both basic and advanced statistical methods to analyze data, interpret results, and design sound research studies. Through practical applications and real-world examples, the course emphasizes the role of statistics in improving health, fitness, and performance outcomes. Students will be equipped to critically evaluate research findings and make informed decisions based on statistical evidence.

EXSC 5337. Tactical Human Performance Assessment & Monitoring. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

This graduate-level course examines the physiological, biomechanical, and psychological demands of tactical occupations, including military, law enforcement, and firefighting. Students will explore advanced methodologies for assessing and monitoring human performance in high-stress, high-risk environments. Emphasis is placed on physiological testing, wearable technology, fatigue management, and data-driven decision-making for optimizing operational readiness. Through hands-on experience and critical analysis of current research, students will develop strategies to enhance resilience, reduce injury risk, and improve mission-specific performance.

EXSC 5340. Motor Learning. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

Motor Learning explores the theory and application of motor learning principles in the context of exercise science and sport. Students will examine the neural and psychological processes involved in skill acquisition, performance, and retention. The course will cover various factors that influence motor learning, including practice conditions, feedback, and individual differences. Students will also develop practical strategies for designing motor skill training programs and evaluating motor performance across diverse populations. Credit will not be awarded for both EXSC 5340 and EXSC 6340.

EXSC 5360. Applied Neuromuscular Physiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).

This course focuses on the roles on the central and peripheral mechanisms that regulate human movement. Students will learn the structure and function of the sensory and motor systems, and understand the generation and control of motor tasks. Additionally, the role of fatigue on muscle and neural pathways. The students will learn non-invasive laboratory techniques in the acquisition of various electrophysiological signals, and will be introduced to various processes in their respective analysis. Credit will not be awarded for both KINE 5360 and KINE 6360.

EXSC 5365. Applied Biomechanics. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).

This course focuses on the application of mechanical principles in the study of human motion. Specifically, the systematic approach in qualitative and quantitative analysis of the human body as it engages in motor activities. This course focuses on developing application in topics related the sport performance, exercise, and rehabilitation via current peer-reviewed research, advancements technologies, and a scientific approach to diagnostics in prevention and care of skeletal muscle. Students must have knowledge of either biomechanics or physics.

EXSC 5380. Capstone in Exercise Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

The Capstone in Exercise Science is a culminating course designed to integrate and apply the knowledge, skills, and experiences gained throughout the exercise science program. This capstone experience provides students with an opportunity to engage in an in-depth, independent project or research study related to their chosen area within exercise science. Under the guidance of faculty mentors, students will demonstrate advanced competencies and contribute to the advancement of knowledge in the field.

EXSC 5383. Fitness and Wellness Applications in Athletic Training. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).

This course is designed to teach students how to instruct clients/patients in the principles of ergodynamics and their relationship to the prevention of illness and injury. Additionally, students will be exposed to various exercise and wellness programming concepts. Students will also learn how to administer and interpret results of fitness and wellness screenings.

EXSC 5385. Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

An overview and study of various topics related to Exercise Science.

EXSC 5399. Internship. 3 Credit Hours (Lecture: 1 Hour, Lab: 7 Hours).

Supervised experience in related fields in Exercise Science.

EXSC 6340. Motor Learning. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

Motor Learning explores the theory and application of motor learning principles in the context of exercise science and sport. Students will examine the neural and psychological processes involved in skill acquisition, performance, and retention. The course will cover various factors that influence motor learning, including practice conditions, feedback, and individual differences. Students will also develop practical strategies for designing motor skill training programs and evaluating motor performance across diverse populations.. Credit will not be awarded for both EXSC 5340 and EXSC 6340.

EXSC 6360. Applied Neuromuscular Physiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).

This course focuses on the roles on the central and peripheral mechanisms that regulate human movement. Students will learn the structure and function of the sensory and motor systems, and understand the generation and control of motor tasks. Additionally, the role of fatigue on muscle and neural pathways. The students will learn non-invasive laboratory techniques in the acquisition of various electrophysiological signals, and will be introduced to various processes in their respective analysis. Credit will not be awarded for both KINE 5360 and KINE 6360.