EXERCISE SCIENCE

https://www.uvm.edu/cnhs/rms

OVERVIEW

The Master of Science in Exercise Science is for future exercise professionals to acquire a defined scope of theoretical understanding and translational knowledge, skills, and abilities related to the science of exercise, health, and physical performance. Students are provided with a sound understanding of the theoretical underpinnings of human movement and exercise prescription. This knowledge base and skills are critical to address the growing need for evidence-based exercise applications in healthy aging, injury prevention and recovery, prevention and management of chronic disease, and optimizing human performance. With the option for two tracks, non-thesis and thesis, the curriculum has a set of core classes anchoring students in fundamentals of critical inquiry and statistics.

Students develop competencies in exercise science through four core courses. Additionally, students in the thesis track will develop strengths in understanding and using the research tools within exercise science. The program affords elective pathways that enable students to tailor their M.S. program to their individual academic and professional goals, including the option to earn their certificate in Health and Wellness Coaching with eligibility to sit for national board certification.

DEGREES

Exercise Science M.S.

FACULTY

Angelopoulos, Theodore; Professor, Department of Rehabilitation and Movement Sciences, PHD, University of Pittsburgh
Dai, Boyi; Professor, Department of Rehabilitation and Movement Science; PHD, University of North Carolina at Chapel Hill
Gell, Nancy M.; Associate Professor, Department of Rehabilitation and Movement Science; PHD, Auburn University
Tompkins, Connie L.; Associate Professor, Department of Rehabilitation and Movement Science; PHD, University of New Orleans
Tourville, Timothy; Associate Professor, Department of Rehabilitation and Movement Science, PHD, University of Vermont
Vreeland, Kit; Professor, Department of Rehabilitation and Movement Science; EDD., University of Vermont

Courses

EXSC 5990. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

EXSC 5993. Independent Study. 1-18 Credits.
A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

EXSC 6010. Physical Activity and Health. 3 Credits.
Understanding health benefits of physical activity for chronic disease prevention and health promotion throughout the life span, from clinical and public health perspectives. Discussion and application of real-life physical activity measurement, research, and physical activity guidelines.

EXSC 6012. Metabolism, Chronic Conditions. 3 Credits.
An advanced study of metabolic mechanisms in chronic conditions and their impact on exercise responses and prescription across diverse populations and the lifespan. Prerequisite: Exercise Science Graduate student or Instructor permission.

EXSC 6018. Advanced Biomechanics. 3 Credits.
Connects advanced biomechanical theories with the principles of 2D and 3D data collection and offers specific data analysis techniques to quantify human movements. The goal is for students to identify the advantages and limitations of different analyses and apply the biomechanical knowledge and MATLAB programming skills to solve their own research or practical questions for performance enhancement, rehabilitation, and injury prevention in exercise, clinical, sports, and other relevant settings. Pre/Co-requisite: Graduate student.

EXSC 6020. EBP in Physical Activity. 3 Credits.
The course addresses the role of research in physical activity promotion and practice including utilization, dissemination and models of evidence-based practice. Refereed research and systematic reviews will be utilized to examine issues and consensus on aspects of measurement of-, factors influencing-, and promoting physical activity. Prerequisite: Undergraduate Statistics course or Instructor permission.

EXSC 6024. Sports Medicine and Performanc. 3 Credits.
Examines sports medicine topics and considers evidence-based practices for the interconnectedness of athletic health and performance. With an investigative and clinical approach, students will critically consider strategies and techniques to improve performance while managing the health of their clients. Prerequisite: Exercise Science MS student.

EXSC 6030. Phys Act & Chronic Dis Epidem. 3 Credits.
Understanding health benefits of physical activity on chronic disease prevention and health promotion throughout the life span, from clinical and public health perspectives. Discussion and application of real-life physical activity assessment, research, guidelines, and promotion in population levels.

EXSC 6032. Adv Motor Control and Learning. 3 Credits.
Explores the behavioral, neurophysiological, and computational mechanisms underlying motor skill acquisition and learning. Students critically evaluate theoretical and methodological frameworks and apply advanced motor learning concepts to research and practical problems in performance, rehabilitation, and skill development. Prerequisite: Graduate student.

EXSC 6035. Lived Experience & Technology. 3 Credits.
Explores lived experiences of neurological injury and emerging rehabilitation technologies through patient interactions, interdisciplinary lectures, and projects integrating science, engineering, and clinical perspectives to develop technology-informed, patient-centered solutions and a holistic understanding of neurorehabilitation across home, community, and healthcare settings. Prerequisite: Graduate standing.

EXSC 6045. Advanced Exercise Physiology. 3 Credits.
Provides a theoretical basis for understanding the body's physiological responses to exercise. Specifically, the course investigates how the support systems of the body (respiratory, cardiovascular, muscular, etc.) function in cooperation with human energy production to ensure that energy is provided for exercise. Emphasis will be placed upon the practical application of exercise physiology principles to physical training practices and coaching. Prerequisite: Exercise Science MS student.

EXSC 6058. Research Methods in Exsc Sc. 3 Credits.
Introduction to research planning, ethical issues, research designs, and publication to provide students with content knowledge, statistical skills, and confidence to design, collect, and analyze their thesis/dissertation projects and present their research in exercise science and related fields. Prerequisite: Graduate student.

EXSC 6090. Capstone Experience. 3 Credits.
Culminating experience for Master of Science Exercise Science students that includes integration and application of relevant knowledge and skills from the master of science curriculum. Prerequisite: Exercise Science Graduate student.

EXSC 6391. Master's Thesis Research. 1-18 Credits.
Designed to assist in development and completion of the thesis and includes settling on a topic and research question, researching the topic, gathering and analyzing data and preparing drafts for the advisor and/or committee, rewriting and editing, and preparing the final document for publication. Prerequisites: Exercise Science graduate student; Instructor permission.

EXSC 6450. Exercise Assessment & Prescrip. 3 Credits.
Expand upon the clinical aspects of exercise physiology to evaluative and prescriptive aspects of exercise programming. Students will gain an understanding of how to evaluate testing results and prescribe safe and effective exercise programs using ACSM guidelines. Prerequisite: Physical Activity & Wellness Science Graduate student.

EXSC 6500. Physical Activity and Disease. 3 Credits.
Empirically based exploration of the relationship between physical activity and chronic disease conditions such as obesity, cardiovascular disease, and type 2 diabetes. Co-requisite: Physical Activity & Wellness Science Graduate student.

EXSC 6540. Phys Act & Wellness Promotion. 3 Credits.
Examines leading theories of health behavior with emphasis on applying theoretical constructs in effective physical activity promotion. Multiple levels of influence on promoting behavior change, including policies, environments, social and personal factors, will be considered in light of contemporary challenges in health promotion. Prerequisite: Physical Activity & Wellness Science Graduate student.

EXSC 6600. Energy Balance. 3 Credits.
Empirically based exploration of human metabolism, energy balance, and weight management. An in-depth study of gold- standard and cutting- edge scientific literature regarding the impact of energy expenditure through physical activity and energy. Prerequisite: Physical Activity & Wellness Science Graduate student.

EXSC 6650. Activity in the Underserved. 3 Credits.
Emphasizes content areas related to access and accommodation in physical activity for individuals from underserved populations. Foci will include health promotion, physical activity barriers, and designing and modifying physical activity programs in schools, recreational programs, community settings, and sport. Prerequisite: Physical Activity & Wellness Science Graduate student.

EXSC 6680. Phys Act Prog Design and Mngmt. 3 Credits.
Comprehensive overview of the practical and theoretical skills needed to plan and implement physical activity and wellness programs in a variety of settings. An examination of the best practices in programming and recommendations for designing evidence- and theory-based interventions will be covered. Over the course of the semester, students will develop components of a health promotion program ultimately leading to the development of a comprehensive health promotion program. Co-requisite: Physical Activity & Wellness Science Graduate student.

EXSC 6700. Phys Act: Communication & Eval. 3 Credits.
Focus on implementation of physical activity promotion which includes effective communication strategies, assessing methods of implementation, and evaluation of program outcomes. Prerequisite: Physical Activity & Wellness Science Graduate student.

EXSC 6990. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

EXSC 6991. Internship. 1-18 Credits.
On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

EXSC 6993. Independent Study. 1-18 Credits.
A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

EXSC 6994. Teaching Assistantship. 1-3 Credits.
Student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

EXSC 6995. Graduate Independent Research. 1-18 Credits.
Graduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.