REHABILITATION AND MOVEMENT SCIENCE (REMS)

REMS 540. Cardiovascular Pathophysiology and Pharmacology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: HPEX 375 and HPEX 440 or equivalents. Presents theoretical principles of electrocardiography and the effects of pharmacological intervention in the treatment of cardiovascular disease. Specific emphasis placed on myocardial ischemia, myocardial infarction and their treatment through exercise rehabilitation protocols. The impact of pharmacological agents on the ECG and on exercise are explored.

REMS 608. Advanced Musculoskeletal Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students registered in the REMS program or by permission of instructor. Examines the structure and function of tissues of the musculoskeletal system. Investigates mechanisms of healing of these tissues and explores the affects of various modalities, altered use and disease on the structure and function of musculoskeletal tissues.

REMS 611. Biomechanics of Human Motion. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Enrollment restricted to students registered in the REMS program or by permission of instructor. Applies knowledge and methods of mechanics in the study of the structure and function of the human body as applied to sport, physical activity and rehabilitation. Topics include kinematics, kinetics and methods of biomechanical analysis.

REMS 612. Advanced Biomechanics. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Prerequisite: REMS 611 or permission of instructor. Enrollment restricted to students registered in the REMS program or with permission of instructor. Applies advanced biomechanics techniques to the evaluation and quantification of human performance. Encourages scientific thought with practical applications.

REMS 660. Neuromuscular Performance. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students registered in the REMS program or by permission of instructor. Examines the interrelationships between the musculoskeletal and neuromuscular systems. Includes examination of normal and abnormal biomechanics of the musculoskeletal system, biomechanical factors related to human performance, as well as acute and chronic adaptations of the neuromuscular system. Emphasizes how these principles can be applied to physical training in healthy and diseased populations and treatment and rehabilitation in the sports medicine setting.

REMS 665. Instrumentation in Motion Analysis. 3 Hours.
2 lecture and 2 laboratory hours. 3 credits. Designed for students in the interdisciplinary Ph.D. in Rehabilitation and Movement Science Program. Examines theories, principles, and applications of systems used to qualify and characterize movement.

REMS 690. Research Seminar in Rehabilitation and Movement Science. 0.5 Hours.
Seminar course; 0.5 credit. Seminar course designed for students in the interdisciplinary Ph.D. in Rehabilitation and Movement Science Program. Presentation and discussion of research reports and topics of interest. Advances skills in critical analysis and discussion leadership. Topics and research presentations vary from semester to semester and are coordinated by the instructor of record. May be repeated. Graded as pass/fail.

REMS 692. Independent Study. 1-3 Hours.
Semester course; 1-3 independent study hours. 1-3 credits. May be repeated for 6 credits. Determination of the amount of credit and permission of the instructor and division head must be procured prior to registration. Cannot be used in place of existing courses. An individual study of a specialized issue or problem in health or movement sciences. Crosslisted as: HEMS 692.

REMS 701. Applied Physiology. 4 Hours.
Semester course; 4 lecture hours (delivered face-to-face or hybrid). 4 credits. Investigates the effect of acute and chronic exercise stimuli on human performance and select disease states. Topics to be addressed include exercise bioenergetics, metabolic responses to exercise, contributions to substrate selection and utilization during exercise, muscular performance and adaptations to exercise training, cardiovascular adaptation to exercise, aerobic and anaerobic training programs, and effects of training on fitness and performance.

REMS 702. Advanced Exercise Physiology II. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PHIS 501 or other graduate-level mammalian physiology course or permission of instructor, and REMS 701. Investigates the effect of physiological stressors on human performance and health through lecture and article discussion. Topics to be addressed include exercise in the heat and cold, effects of altitude on physical performance, acute and chronic endocrine responses to exercise, role of adipokines in chronic disease conditions, the use of ergogenic aids in sport.

REMS 703. Cardiovascular Exercise Physiology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. Investigates the structural, functional and cellular principles of human cardiovascular physiology as applied to health and human performance. Emphasis will be placed on the metabolic, contractile and hemodynamic adaptations to acute and chronic exercise training.

REMS 704. Psychobiology of Physical Activity. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. "Psychobiology" is defined as the integrative study of behavior from the social, cognitive and biological levels of analysis. This course will include an examination of the research that encompasses psychophysiology, psychoneuroendocrinology, psychoneuroimmunology, neuroscience, physiological psychology and behavioral genetics applied to exercise.

REMS 705. Metabolic Aspects of Physical Activity. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment requires permission of instructor. This course is designed to explore the thermic effects of physical activity in apparently healthy individuals, as well as those with increased risk for cardiovascular, metabolic or other inflammatory diseases. Additionally, the relationship between physical activity and food intake, resting metabolic rate and dietary-induced thermogenesis will be reviewed. The examination of gastrointestinal function during dietary manipulation will also be assessed to address performance enhancement in several types of physical activities. This course will emphasize the metabolic control of ATP synthesis, which includes carbohydrate, lipid and protein metabolism and their interaction with one another in response to biological needs during rest and physical activity.

REMS 706. Development and Motor Control. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment restricted to students admitted to the REMS program or by permission of instructor. Explores theories of developmental motor control and examines theoretical influences on development of infants and young children who are typically developing as well as those with developmental disabilities. Engages students in critical literature review relevant to motor development and rehabilitation and in the application of theory to practice and research design.

REMS 707. Programing for Rehabilitation Sciences. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: REMS 611 or equivalent. Enrollment is restricted to students in the rehabilitation and movement sciences program or with permission of the instructor. Develops proficiency in processing and analyses of kinematic, kinetic and electrophysiological data (e.g. EMG) typically associated with biomechanical labs. Focuses on coding in common packages to achieve the goals of reading in data from various sources, construction of multidimensional arrays, filtering, data visualization and extraction. Upon completion of this course, students will able to independently import time series data, process and extract variables of interest, and write the output variables of interest to a format suitable for statistical analyses packages (e.g., SPSS, SAS, R).

REMS 710. Research Techniques in Rehabilitation and Movement Science. 1-3 Hours.
50 hours of laboratory times per credit hour. 1-3 credits. Prerequisite: Permission of instructor required. Examines and explores laboratory techniques used in rehabilitation and movement science research. Provides opportunity to begin transitioning clinical problems to research questions. Opportunities in laboratories of the rehabilitation and movement science program or other laboratories approved by the adviser or program directors. Focuses on individual student learning needs. Graded as pass/fail.

REMS 793. Teaching Practicum in Higher Education. 1 Hour.
50 hours of contact/preparation time for each credit. 1 credit. Practicum designed for students in the interdisciplinary Ph.D. in Rehabilitation and Movement Science degree program. Develops skills necessary for classroom teaching including preparing and presenting selected topic (s), writing test questions, and grading examinations. May be repeated for additional teaching experience. Graded as pass/fail.

REMS 794. Research Presentation Seminar. 1 Hour.
1 lecture hour. 1 credit. Seminar course designed for students in the interdisciplinary Ph.D. in Rehabilitation and Movement Science Program. Develops presentation skills. Requires preparation and presentation of research at a public research forum scheduled by the instructor of record. Students are expected to submit their research for presentation at a selected regional, national or international conference in a related field. Graded as pass/fail.

REMS 798. Research in Rehabilitation and Movement Science. 1-12 Hours.
Semester course; 1-12 credits. Research leading to the Ph.D. degree and elective research projects for students in the Rehabilitation and Movement Science doctoral program. May be repeated. Graded as "S," "U" or "F.".