EXERCISE SCIENCE (EXSC)

EXSC 507 - Exercise, Sport, and Nutrition (3 Credits)
The relationship between exercise, sport performance, and nutrient metabolism.
Prerequisites: EXSC 223, EXSC 224, EXSC 330, EXSC 330L.

EXSC 531 - Clinical Exercise Physiology (3 Credits)
Scientific bases of clinical exercise programming. The fitness instructor's role in encouraging changes in exercise behavior.
Prerequisites: EXSC 223, EXSC 224, EXSC 330, EXSC 330L.

Corequisite: EXSC 531L.

EXSC 531L - Clinical Exercise Physiology Lab (0 Credits)
Prerequisite: EXSC 223, EXSC 224, EXSC 330, EXSC 330L.

EXSC 541 - Physiological Basis for Strength and Conditioning (3 Credits)
Investigation on the physiological basis for strength and conditioning. Principles of strength and conditioning through lecture based learning, demonstrations, and through laboratory activities.
Prerequisites: C or better in EXSC 330.

EXSC 555 - Current Topics in Exercise Science (1-3 Credits)
Content varies by title. Course may be repeated for a total of 6 credit hours.

EXSC 562 - Impairments of the Human Motor System (3 Credits)
Role of motor development in the growth and development of individuals exhibiting impaired motor control.
Prerequisites: biology, anatomy, physiology, or the equivalent.

EXSC 563 - Physical Activity and the Physical Dimensions of Aging (3 Credits)
The effects of age and physical activity on physical and motor functions of elderly individuals.
Prerequisites: EXSC 223, EXSC 224, EXSC 351, EXSC 330, EXSC 330L.

EXSC 585 - Women's Health and Physical Activity (3 Credits)
Sex differences in diseases, physiological function of sex hormones, hormonal changes in a woman's life, specific women's health issues, and role of physical activity and exercise in prevention and treatment of conditions and diseases specific to women or related to sex hormones. Restricted to 30 students, Special Permission by Instructor.

EXSC 608 - Apps, Wearables and Technology for Lifestyle Behavior Change and Weight Loss (3 Credits)
The course will increase students' understanding of the theoretical foundations, scientific evidence and practical application of technology-assisted lifestyle interventions, with an emphasis on behavioral weight control for adults.
Prerequisites: C or better in EXSC 410.

EXSC 610 - Neuroscience of Human Performance (3 Credits)
Application of neuroscientific theories and measurements to human performance and expertise.
Prerequisites: C or better in EXSC 330, EXSC 330L, EXSC 351, and EXSC 410.

EXSC 620 - Nutrition and Immunology (3 Credits)
Examination of the interrelationships that link human nutrition to the immune system in health and disease. Topics will include basic immunology, overview of nutritional sources, deficiencies and excesses, and the impact on public health issues such as exercise, disease and aging.
Prerequisites: EXSC 330.

EXSC 641 - Neuromuscular Basis of Functional Strength Training (3 Credits)
The aim of this course is to acquire a fundamental understanding of how concepts from motor learning, neurophysiology, and muscle physiology are applied to functional strength training.
Prerequisites: C or better in EXSC 330, EXSC 330L, EXSC 351.

EXSC 651 - Analysis of Everyday Motor Behavior (3 Credits)
Students in this course will analyze everyday activities to gain insight into how humans plan, initiate, execute and refine motor skills. Students will also learn how to evaluate research on motor behavior and how to create novel studies aimed at advancing our understanding of everyday motor behavior.
Prerequisites: C or better in EXSC 351.

EXSC 660 - Exercise Oncology (3 Credits)
Physiological and psychosocial impact of cancer and its treatments on individuals, and how this impacts the design and delivery of exercise programs before, during and after cancer treatments.
Prerequisites: C or better in EXSC 330 and EXSC 330L.

EXSC 663 - Environmental Exercise Physiology (3 Credits)
This course is designed to provide students a survey of physiological responses to a variety of environments, such as heat, cold, altitude, and microgravity environments, and how the body acclimatizes to these environments with regards to exercise training.
Prerequisites: C or better in EXSC 330 and EXSC 330L.

EXSC 666 - Cardiorespiratory Exercise Physiology (3 Credits)
Examination of the anatomy and function of the cardiovascular and respiratory systems of the exercising human organism, including acute adjustments and chronic adaptations to the systems.
Prerequisites: EXSC 330.

EXSC 669 - Skeletal Muscle Physiology: Form and Function (3 Credits)
Skeletal muscle physiology and exercise through select laboratory experiences and discussion of related research literature.
Prerequisites: C or better in both EXSC 330 and EXSC 330L.

EXSC 695 - Writing and Presenting in Research (3 Credits)
The research process in Exercise Science through participation, presentation, and discussion of current research.
Prerequisites: EXSC 224.

EXSC 700 - Physical Activity and Health: Epidemiology, Research and Practice (3 Credits)
An introduction to exercise science with emphasis on the relationships between exercise and health for promotion of physical activity in clinical and public health settings.

EXSC 706 - Assessment of Motor Behavior (3 Credits)
Assessment of infant, child, adolescent, and adult motor behavior.

EXSC 710 - Behavioral Aspects of Physical Activity (3 Credits)
Psychosocial and behavioral factors in physical activity. Topics include mental health effects of exercise, behavior change theories applied to mental health effects of exercise, behavior change theories applied to physical activity, and physical activity determinants and interventions.
Cross-listed course: HPEB 713

EXSC 711 - Ecological Momentary Assessment in Health Behavior Research (3 Credits)
This course is designed to introduce students to Ecological Momentary Assessment (EMA) or Experience Sampling Methods (ESM) for health behavior research. EMA/ESM is a real-time data capture strategy that can be assisted by mobile technologies to assess behaviors, experiences, and exposures in real-world settings. This course will provide an overview of the EMA literature and introduce different EMA approaches and designs to collect data on individuals' health determinant(s) and/or outcomes. The primary goal of the course is to enable students to apply course concepts and learned skills to develop and implement EMA/ESM in their fields of study.
Prerequisites: Students should have an introductory understanding of research design and quantitative methods; for example, students are expected to complete at least one graduate-level statistics and methods course (examples: EXSC 787, HPEB 707, BIOS 700, BIOS 757, EDRM 711).

EXSC 723 - Genetics in Health Sciences (3 Credits)
The part lecture and part discussion course will explore genetic research in the health sciences, with emphasis on human genetic association studies, clinical utility for personalized medicine, direct-to-consumer genetic testing, and ethical issues. Students will receive hands-on experience searching, interpreting, and summarizing genetic studies on a topic of their choice.

EXSC 727 - Controlled Trials in Exercise Science (3 Credits)
This course covers planning, organizing and implementing randomized controlled trials of physical activity or exercise interventions. It is primarily aimed to meet the needs of graduate students in exercise science and others in related fields.

EXSC 731 - Mechanisms of Motor Skill Performance (3 Credits)
A study of theories and mechanisms involved in human movement. Focus is on analysis of principles and systems of gross motor control and learning.

EXSC 732 - Measurement of Body Composition and Associated Health Behaviors (3 Credits)
Overview of measurement theory and measures to assess body composition and associated health behaviors (i.e., physical activity, sedentary behavior, sleep, diet).
Prerequisites: BIOS 700, BIOS 701, or PUBH 725; for MPH-PAPH students, EXSC 700.

EXSC 735 - Applied Human Biomechanics (3 Credits)
This course focuses on fundamentals of biomechanics emphasizing measurement of human movement and motor control. Content presented is essential to understanding human movement, exercise training, movement impairment and injury. Utilization and interpretation of instrumentation for capturing, describing and quantifying human movement and motor control will be covered (e.g., electromyography, kinematics).

EXSC 742 - Clinical Exercise Testing (1 Credit)
Study of the procedures involved in screening and testing persons with varying levels of functional work capacity.

EXSC 754 - Community-Based Physical Activity Interventions (3 Credits)
Role of the physical activity specialist within the community health department. Development, initiation, and evaluation of campaigns, resources, community capacity building, and coalitions to promote physical activity.
Prerequisites: EXSC 700 or HPEB 700.

EXSC 755 - Special Topics in Exercise Science (3 Credits)
A study of selected issues in exercise science. Content varies by title.

EXSC 775 - Neural Basis of Skilled Motor Behavior (3 Credits)
Current and historical perspectives on the neural basis of skilled motor behavior.
Prerequisites: EXSC 731.

EXSC 776 - Ergogenic Aids: Science vs. Myth (3 Credits)
Examine the current evidence related to popular nutritional and pharmacological ergogenic aids.

EXSC 777 - Endocrinology of Exercise and Health (3 Credits)
The course examines the endocrine system, its interaction with the nervous system, and how they affect human biology before, during, and after exercise. Special attention will be paid to this system's influence on the relationship between physical activity and health.
Prerequisites: At least one undergraduate or graduate course in statistics and molecular or cellular biology.

EXSC 778 - Exercise and Childhood Obesity (3 Credits)
Causes and treatment of childhood obesity with special reference to the role of exercise in prevention and early intervention.

EXSC 780 - Physiology of Exercise (3 Credits)
Physiological responses to exercise: skeletal muscle structure and function, cardiorespiratory function, physiological determinants of exercise performance, and training adaptations. Didactic and laboratory included.

EXSC 781 - Physiology, Exercise, and Disease (3 Credits)
The input and response to exercise in diseased populations. Diseases to be examined include cardiovascular disease, age-related diseases, pulmonary, renal, and other conditions.
Prerequisites: EXSC 780.

EXSC 783 - Research Seminar in Exercise Physiology (1-3 Credits)
Presentation and discussion of current research topics in exercise physiology.

EXSC 784 - Cardiovascular/Pulmonary Testing and Programming (3 Credits)
Techniques used in exercise testing (including principles of electrocardiology) and in design and delivery of exercise programs for enhancing the health of normal and cardiopulmonary-diseased populations.
Prerequisites: EXSC 781.

EXSC 787 - Research Methods and Design for Exercise Science (3 Credits)
The major goal of this course is to provide an in-depth examination of: research concepts, terminology, experimental, non-experimental, and epidemiological designs, internal and external validity, methods for establishing causality investigating associations, and application of designs to test hypotheses in research of exercise science-related outcomes.

EXSC 790 - Independent Study (1-3 Credits)
Topics to be assigned and approved by advisor, graduate director, and department head.

EXSC 795 - Internship in Exercise Science (3 Credits)
Clinical practice in an applied area of exercise science. Requirements include at least 20 hours fieldwork per week with intensive supervision.

EXSC 796 - Physical Activity Integrative Learning Experience (2 Credits)
This course is designed to provide students with a culminating seminar focused on the synthesis of foundational and MPH-PAPH competencies in preparing a high quality grant proposal to address a public health problem.
Prerequisites: C or better in PUBH 724, PUBH 725, PUBH 726, PUBH 730, and PUBH 735; B or better in EXSC 700, EXSC 710, and EXSC 780.

EXSC 797 - Physical Activity Applied Practice Experience (1-5 Credits)
The focus of this course is the performance of a limited work or service project in an approved public need setting and the demonstration of at least 5 competencies related to previously identified aspects of the student's chosen role.
Prerequisites: C or better in PUBH 724, PUBH 725, PUBH 726, PUBH 730, and PUBH 735; B or better in EXSC 700, EXSC 710, and EXSC 780.

EXSC 798 - Project in Exercise Science (3 Credits)
Independently executed project designed to expand the student's knowledge of exercise science.

EXSC 799 - Thesis Preparation (1-9 Credits)

EXSC 801 - Ethical Conduct in Public Health Research (1 Credit)
The course will provide an overview of ethical issues scientists encounter conducting and disseminating public health research. Topics include the history of ethics in public health, working with human participants, conflicts of interests, spin, and creating safe and healthy workplaces.

EXSC 802 - Predoctoral Fellowship Writing Course with Special Emphasis on NIH F31 (1 Credit)
The course is designed to enable predoctoral students to gain grant writing experience, develop into productive, independent research scientists, and to obtain mentored research training while conducting dissertation research.

EXSC 805 - Introduction to Systematic Reviews and Meta-Analysis (1-3 Credits)
The major goal for all students taking this course is to provide an overview of how to conduct systematic reviews and meta-analyses from published scientific literature. Emphasis is placed on developing a working knowledge of how to conceptualize a literature review, keyword search for relevant articles through online databases, define inclusion and exclusion criteria, develop coding schemes for study information, and the calculation of effect sizes using published data. For students taking more than 1-credit the additional goals are to provide hands-on experience in conducting a systematic review and meta-analysis, calculating effect sizes, and learning to use meta-analysis software.
Prerequisites: C or better in BIOS 700 and BIOS 701 or their equivalent; C or better in BIOS 757 or equivalent is strongly recommended.

Cross-listed course: EPID 805

EXSC 808 - Neuro Repair - Rehabilitation (3 Credits)
Examination of neural repair and rehabilitation from a clinical perspective.

EXSC 880 - Myology and Exercise (3 Credits)
Study of muscle contraction mechanics, energetics, and metabolism and the relationship of these processes to physical training, athletics, and rehabilitation.

EXSC 881 - Advanced Cardiorespiratory Exercise Physiology (3 Credits)
Study of mechanisms for cardiovascular and respiratory responses to acute exercise and adaptations to these systems with chronic physical activity.

EXSC 882 - Physical Activity and Health: Epidemiology and Research Methods (3 Credits)
An examination of physical activity/exercise habit patterns as they relate to health status. Emphasis on the chronic effects of exercise.

EXSC 899 - Dissertation Preparation (1-12 Credits)