Exercise Science (EXSC)

Courses

EXSC-403. Introductory Research Methods And Statistical Analysis. 3 Hours.
The course provides an introduction to a number of basic research designs and the appropriate parametric and/or non-parametric statistical tests for the analysis of data collected using these designs. Additionally, the students will be given an overview of the research process, the various types of research and the various avenues for research presentation.

EXSC-404. Exercise Testing And Prescription. 3 Hours.
The laboratory component of the course provides instruction and experience in the performance of laboratory and field tests for the measurement of variables needed to evaluate the health-related fitness components (i.e., cardiorespiratory endurance, muscular strength/endurance, muscular flexibility, and body composition). The lecture component of the course focuses on the physiological rationale for these tests and covers the procedures for utilizing the information collected in laboratory and field testing. Specifically, students will be instructed on the evaluation the health-related fitness status of tested individuals and on the prescription of exercise training regimens for health-related fitness status alteration and physical performance enhancement. An equipment fee of $125 is required.

Prerequisites: EXSC-402 minimum grade of D and EXSC-403 (http://catalog.neiu.edu/search/?P=EXSC-403) minimum grade of D.

EXSC-405. Applied Nutrition. 3 Hours.
The course provides instruction in macronutrient requirements at rest and during exercise, energy balance for body composition alteration or maintenance (i.e., obesity prevention), fluid and electrolyte balance during exercise, and the vitamin/mineral concerns associated with exercise and performance. Additionally, the course will consider the preventative role of nutrition in various disease states including cardiovascular disease, degenerative bone disease, and diabetes.

Prerequisite: EXSC-401 minimum grade of D.

EXSC-413. Program Development And Management In The Fitness Industry. 3 Hours.
The course provides instruction in the area of organizational development and management in the corporate, commercial and institutional fitness industries. Specifically, an overview and the underlying principles of operating fitness facilities, sales/marketing strategies, member/ staff recruitment/ management practices, program/ specialized program management, equipment purchase/ maintenance, health/ safety considerations, facility development/ management, financial management, legal issues, and insurance considerations will be discussed.

EXSC-414. Program Development And Management In Health Promotion. 3 Hours.
The course provides instruction in the area of organizational development and management in the health promotion field. Specifically, the procedures for needs assessment, planning, implementation, resource identification/ allocation, marketing and evaluation for health promotion programs will be discussed.

EXSC-415. Exercise Management In Chronic Diseases And Disabilities. 3 Hours.
The course expands on the exercise testing and prescription information covered in EXSC-404 (http://catalog.neiu.edu/search/?P=EXSC-404) to include special population with chronic disease and/or disabilities. The course provides a pathophysiological overview of various cardiovascular, pulmonary, metabolic, immunological/hematological, orthopedic, neuromuscular, cognitive, emotional and sensory disorders. A major portion of the course deals with exercise management in people with these disease/ disabilities and, in particular, instruction on the special exercise testing and prescription considerations for these populations (e.g., abnormal exercise response potential, exercise interaction with commonly prescribed medication, etc.).

Prerequisite: EXSC-404 (http://catalog.neiu.edu/search/?P=EXSC-404) minimum grade of D.

EXSC-416. Practices In Cardiac Rehabilitation. 3 Hours.
The course provides the student with a concise and comprehensive overview of the research and currently accepted professional practice in the fields of heart disease primary prevention and cardiac rehabilitation. Specifically, the epidemiology, pathophysiology, diagnosis and treatment of heart disease will be discussed. Included in these discussions will be the diagnostic and prognostic use of exercise testing in cardiac patients. Additionally, a significant portion of the course will cover cardiovascular disease risk factor modification and the rehabilitation cardiac patients, including exercise prescription guidelines for this special population.

Prerequisite: EXSC-404 (http://catalog.neiu.edu/search/?P=EXSC-404) minimum grade of D.

EXSC-417. Human Sexuality. 3 Hours.
The course provides instruction in the anatomical, phsyiological, developmental, psychosocial, cultural and health-related aspects of human reproduction and sexuality. The primary goal of the course is to enhance student understanding and comfort with regard to these topics.

EXSC-418. Current Topics In Exercise Science. 3 Hours.
The course provides students with the opportunity to explore the current research in the various areas that encompass the Exercise Sciences. Additionally, students are provided with a venue in which to discuss, with their peers and their professors, these topics salient to their professional growth and development. Understanding of these current topics is evaluated through the students' written reviews, oral presentations, and participation in class discussions of the presented reviews.

Prerequisites: EXSC-401 minimum grade of C and EXSC-402 minimum grade of C and EXSC-403 (http://catalog.neiu.edu/search/?P=EXSC-403) minimum grade of C and EXSC-405 (http://catalog.neiu.edu/search/?P=EXSC-405) minimum grade of C.
EXSC-419. Psychology Of Exercise & Health Behaviors. 3 Hours.
The course provides instruction in the biopsychology and applied psychology of exercise and health behaviors. The neurological basis of learning as it is integrated into the learning of behaviors will be emphasized within the context of individual characteristics, motivation, psychological interventions, and social processes that influence exercise and health behaviors.

EXSC-420. Prevention Of Chronic Disease Through Diet & Exercise. 3 Hours.
The course covers the molecular and cellular basis of prevention of chronic diseases. The emphasis is on the biological mechanisms of the causes of chronic diseases and on how dietary components and repeated stressful exercise alter the mechanisms of cause to reduce risk for these diseases. The major topics include: inflammation, obesity, metabolic syndrome and diabetes, atherosclerosis, and cancer.
Prerequisites: EXSC-401 minimum grade of C and EXSC-405 (http://catalog.neiu.edu/search/?P=EXSC-405) minimum grade of C.

EXSC-421. Motor Control And Learning. 3 Hours.
The course provides instruction in how humans control locomotion and how they learn/re-learn motor skills. Specifically, the course emphasizes the observable behavioral aspects of motor control/learning while detailing the neurophysiological and biomechanical processes that result in the aforementioned motor behaviors.
Prerequisite: EXSC-403 (http://catalog.neiu.edu/search/?P=EXSC-403) minimum grade of D.

EXSC-422. Biomechanics. 3 Hours.
The course provides instruction in how the interaction between anatomy, physiology, and the laws of physics affect and control human movement and performance. Specifically, the biomechanical of work and energy, balance and movement control, force load and force production, and fatigue during exercise and performance will be discussed.
Prerequisites: EXSC-402 minimum grade of D and EXSC-403 (http://catalog.neiu.edu/search/?P=EXSC-403) minimum grade of D.

EXSC-425. Exercise And Environmental Physiology. 3 Hours.
The course provides instruction on how the human body functions in stressful environments, and how these environments may alter human performance. Specifically, the effect of heat/humidity, cold/windchill, depth, altitude and air pollution on the physiology of the resting and exercising human body will be discussed.
Prerequisite: EXSC-402 minimum grade of D.

EXSC-426. Growth, Maturation, And Performance. 3 Hours.
The course provides instruction on the biological growth and maturation processes, the effects of physical activity on child and adolescent growth, and the physical performance ability variations seen throughout growth and maturation. Included will be discussions on the age/gender- variations in growth and performance, the factors regulating/influencing growth, maturation and performance, the chronic disease and injury risk factors in children, and other critical issues that must be considered when dealing with physical performance in children and adolescents.
Prerequisites: EXSC-402 minimum grade of D and EXSC-405 (http://catalog.neiu.edu/search/?P=EXSC-405) minimum grade of D and EXSC-421 (http://catalog.neiu.edu/search/?P=EXSC-421) minimum grade of D.

EXSC-427. Competitive Performance In The Disabled. 3 Hours.
The course provides instruction on the history, current status, and future directions of disability sport within our society. Specific discussions will include the psychosocial and medical issues that must be considered when working with the physically active disabled, and the existing sports, sport modifications, participation opportunities, and participation barriers for individuals with performance-altering impairments.

EXSC-428. Female-Specific Performance Issues. 3 Hours.
The course provides instruction on critical medical, physiological, psychosocial and behavioral issues for the physically active female from prepubesence through maturity. The female-specific topics to be discussed related to exercise and performance include physiology, potential injury risks, physical and hormonal variations, health issues, activity and aging, exercise training prescription, substance abuse, eating disorders, and the psychosocial attitudes towards the athletic female.
Prerequisites: EXSC-402 minimum grade of D and EXSC-405 (http://catalog.neiu.edu/search/?P=EXSC-405) minimum grade of D.

EXSC-430. Internship. 3 Hours.
The course provides students the opportunity to gain practical exercise science (e.g., fitness, wellness, or human performance) career experience in corporate, commercial, institutional, community, educational, rehabilitative or research settings.

EXSC-431. Independent Study/Research. 3 Hours.
The course affords students the opportunity to conduct an independent experimental, descriptive, analytical or qualitative research project within the exercise sciences. The credit hours can also be used for faculty-monitored learning of advanced laboratory methodology not covered in the current curriculum. Planning of the proposed research project or independent study must be supervised and approved by an EXSC faculty member prior to course enrollment approval. Submission of a written report of the completed research project or independent study will be required for all students.
Prerequisite: EXSC-403 (http://catalog.neiu.edu/search/?P=EXSC-403) minimum grade of D.

EXSC-432. Thesis Research. 6 Hours.
For those students selecting the Thesis Option for the Master of Science in Exercise Science degree, the course provides faculty guidance in the areas of research question development, research design, data analyses, data interpretation, written research presentation and oral research presentation.
Prerequisite: EXSC-403 (http://catalog.neiu.edu/search/?P=EXSC-403) minimum grade of D.
EXSC-433. Performance-Related Injury Management. 3 Hours.
The course provides instruction in the prevention and management of injuries related to human performance. The topics discussed include an overview of the athletic training profession, techniques for injury risk management, the pathology of injury, various injury management skills (e.g., psychosocial intervention, injury evaluation/emergency care, therapeutic modalities, exercise rehabilitation and pharmacology), and an overview of the evaluation, care, and rehabilitation of various specific performance-related injuries.
Prerequisites: EXSC-402 minimum grade of D and EXSC-405 (http://catalog.neiu.edu/search/?P=EXSC-405) minimum grade of D.

EXSC-434. Physiology Of Aging And Physical Activity. 3 Hours.
The course provides instruction in the theories of the aging process and the age-related changes in the functioning of various physiological systems. Specifically, the age-related changes in bioenergetics, work capacity/efficiency, cardiopulmonary function, muscular strength, endurance, motor control, motor performance, and psychosocial functioning, among other variables are discussed. Additionally, the potential role of physical activity and exercise in the alteration of these age-related changes, quality of life indices, functional capacity, and productivity in the elderly will be presented.
Prerequisite: EXSC-402 minimum grade of D.

EXSC-435. Theory & Methodology Of Coaching. 3 Hours.
The course provides instruction on the theories and methodologies of sport coaching. Specific emphasis will be placed on the planning, implementation and assessment aspects of coaching, including the philosophical foundations of coaching, technical and tactical coaching principles and player assessment strategies.
Prerequisite: EXSC-421 (http://catalog.neiu.edu/search/?P=EXSC-421) minimum grade of C.

EXSC-442. Sports-Specific Exercise Training. 3 Hours.
This course integrates the cellular basis of performance enhancement with the components of fitness and of skill enhancement to develop an integrated and applied-science approach to exercise training for: the maximum-performance/moderate-skill sports of sprint long-distance running, cycling, and swimming; the high-level fitness/high-skill sports of gymnastics, hockey, and soccer, and to the lower-level fitness/high-skill sports of basketball, football, and golf.
Prerequisites: EXSC-403 (http://catalog.neiu.edu/search/?P=EXSC-403) minimum grade of C and EXSC-421 (http://catalog.neiu.edu/search/?P=EXSC-421) minimum grade of C.

EXSC-444. Cellular Physiology Of Exercise. 3 Hours.
The course provides instruction in the bioenergetics of human movement. Specifically, cellular metabolism and its neuroendocrine control, at rest and in response to both acute and chronic exercise, will be discussed. Additionally, the processes and control of transcription, protein synthesis, and protein degradation will be covered.
Prerequisites: EXSC-440 minimum grade of C and EXSC-441 minimum grade of C.

EXSC-445. Cardiovascular & Respiratory Physiology Of Exercise. 3 Hours.
The course provides advanced instruction in the functioning of the respiratory, cardiovascular and skeletal muscular systems at rest and during exercise. Specifically, the course will provide instruction in pulmonary ventilation, myocardial functioning, circulatory response and skeletal muscle contraction, as well as neuroendocrine control of these processes, at rest and during exercise. Additionally, the exercise-specific application of these physiological processes will be discussed in reference to strength/endurance exercise training adaptations, neuro-muscular fatigue, ergogenic aids (i.e., human performance enhancement substances), gender-related performance differences, and youth exercise/performance.
Prerequisites: EXSC-440 minimum grade of C and EXSC-441 minimum grade of C.