

EXERCISE PHYSIOLOGY (EXCM)

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EXCM 101 Introduction to Exercise Physiology (3 Credit Hours)

Introduction to the major; also includes a lab component covering Emergency Procedures and Safety Skills, introduction to common safety principles, predisposing factors and common causes of accidents, injuries and illnesses.

This course satisfies the Engaged Learning requirement.

EXCM 115 NCCA Personal Training Elective (1 Credit Hour)

This course encompasses an overview of key Exercise Science, training methodology and health behavior change principles. Students will then apply each principle into practice through screening and evaluation, exercise program design, and ethical, legal and professional responsibilities and guidelines.

Outcomes:

Upon successful completion of the course, the student will be able to: Apply key exercise science, training methodology and health behavior change principles in context to the provision of exercise; Apply the practice of exercise and fitness screening and assessment, health appraisal and risk stratification, while simultaneously integrating ethical considerations and client preferences

EXCM 117 NCCA Group Fitness (1 Credit Hour)

This course encompasses an overview of group exercise; to include cardiovascular exercise, strength training and stretching. Students will learn how to lead, instruct and motivate individuals or groups in exercise activities.

Outcomes:

Upon successful completion of the course, the student will be able to: Apply effective, exercise science-based group sessions for different fitness levels; Explain proper technique, demonstrate exercise, and teach appropriate methods to strengthen and stretch certain muscles

EXCM 170 Women's Health and Exercise (1 Credit Hour)

This course presents perspectives on physical activity and exercise science specific to women. It will include the identification of issues during various stages of development in the female body and barriers and benefits of exercise unique to women. Students will apply these perspectives to exercise program design and health care interactions with all clients.

Outcomes:

1) Understand the unique circumstances and outcomes of working with women in the field of wellness and fitness; 2) Identify preventative strategies (such as exercise prescription and nutrition guidance) that can compensate for health risks, issues, and deficiencies that female clients and patients may experience throughout their life; 3) Explain exercise modifications and varied benefits during specific periods in a woman's life (adolescents, pregnancy, postpartum, menopause)

EXCM 201 Physiology of Exercise (4 Credit Hours)

Pre-requisites: EXCM 101 and Anatomy & Physiology (GNUR 155/155L and GNUR 156/156L)

The physiological functions of the body and the effect of exercise on these functions.

EXCM 210 Program Design in Exercise (2 Credit Hours)

Pre-requisites: EXCM 201

This course focuses on the design, implementation and evaluation of exercise programs through case-based application and classroom activities. Health-related components of fitness and fitness assessments are reviewed. Individual and group exercise program designs within community-based settings for individuals through the life cycle are discussed. Evidence-based content is identified to critically analyze and develop conditioning programs and techniques for a broad range of sports and activities. Important elements of program design are used to emphasize desired client program outcomes.

Outcomes:

At the successful completion of the course, the student will be able to: 1) Lead designed group exercises and activities which consider individual needs and differences; 2) Apply training principles and program variables to increase strength, endurance, power, or hypertrophy for the identified client or population; 3) Evaluate the designed exercise prescribed over time for an individual and/ special population; 4) Integrate cognate materials necessary to support the full development of physical performance including nutrition, environment, mobility, clothing and equipment; 5) Design individualized exercise programs for individuals and special groups; 6) Adjust exercise programs based on individual performance and safety considerations

EXCM 301 Advanced Physiology of Exercise (3 Credit Hours)

Pre-requisites: EXCM 201 and Anatomy & Physiology (GNUR 155/155L and GNUR 156/156L)

An advanced course in exercise physiology covering exercise metabolism, temperature regulation and fluid balance.

EXCM 342 Physical Growth, Development and Nutrition (3 Credit Hours)

Pre-requisites: EXCM 101

A survey of the various components involved in personal health and wellness, such as personal fitness, sexuality, mental health, and environmental health as related to the stages of life development.

EXCM 345 Therapeutic Exercise and Rehabilitation (3 Credit Hours)

Pre-requisites: (EXCM 101 & 201) and (BIOL 243 or GNUR 156 & 156L)

Explanation and demonstration of the use of therapeutic modalities in the healing process. This will include discussion of the use of therapeutic modalities to enhance the rehabilitation process after athletic injury.

EXCM 350 Sports Nutrition (3 Credit Hours)

Pre-requisites: EXCM 201, CHEM 102 & CHEM 112

This course introduces the essentials of human nutrition for health and emphasizes the roles of key nutrients for athletic performance. This foundational material will be applied to athletic performance including adaptation and recommendations for training and competition. Nutrient recommendations will be reviewed for specific types of sports, exercise and other athletic concerns. The metabolic basis for sports nutrition recommendations is examined.

EXCM 352 Musculoskeletal Assessment and Strength Training (4 Credit Hours)

Pre-requisites: EXCM 201 and Anatomy & Physiology (GNUR 155/155L and GNUR 156/156L)

This course will present the general principal and foundational skills for each component of the injury examination. These general principles will be applied to the recognition and examination of injuries/conditions specific to each body region. Address general medical conditions will likely encounter with patients.

EXCM 364 Intro to Clinical Exercise Testing and Prescription (3 Credit Hours)

Pre-requisites: EXCM 201 and Anatomy & Physiology (GNUR 155/155L and GNUR 156/156L)

This class summarizes recommended procedures, including EKG and other stress testing modalities, for exercise testing and exercise prescription in healthy and diseased individuals.

EXCM 368 Advanced Clinical Testing and Prescriptions (3 Credit Hours)

Pre-requisites: EXCM 201 and Anatomy & Physiology (GNUR 155/155L and GNUR 156/156L)

This course focuses on physiological implications of metabolic conditions such as diabetes, cardiac and pulmonary disease on exercise. The course includes modifications to exercise testing and in-depth preparation for exercise prescription based on diseases and special conditions. The course reviews contraindications and considerations for exercise, EKG interpretation and implications of physiological responses to exercise. Behavioral strategies to implement in client exercise planning and education are addressed. Exercise prescription is discussed as part of the ongoing evaluation of client performance.

Outcomes:

At the successful completion of the course, the student will be able to:

- 1) Create patient/client focused exercise programs, with modifications and progressive programming based on physiologic alterations;
- 2) Understand the effect of exercise on the physiological systems of the body and disease states;
- 3) Analyze exercise testing data from healthy individuals and individuals with physiological alterations;
- 4) Evaluate EKG responses to exercise;
- 5) Implement testing protocols and modifications for individuals with physiological alterations;
- 6) Understand acute responses and chronic adaptations to exercise and the impact on individuals with physiological adaptations

EXCM 375 Special Populations in Exercise Science (2 Credit Hours)

Pre-requisites: EXCM 201 and EXCM 364

This course provides practical information on exercise for persons with a wide range of health conditions, diseases and disabilities. Best-practice exercise prescription protocols for individuals across the life span will be addressed. An overview of unique physiology, effects of the condition on the exercise response, and effects of exercise training on the condition will be discussed. Recommendations for exercise testing and programming are presented for select populations.

Outcomes:

At the successful completion of the course, the student will be able to: 1) Understand the relations between health conditions, disease, disability and physical activity; 2) Establish physical activity outcomes in individuals with health conditions, diseases or disabilities; 3) Modify existing physical activity prescriptions to match individual capabilities and needs; 4) Demonstrate an understanding of the risks and benefits associated with exercise participation; 5) Analyze the results of exercise tests and fitness evaluations in various populations; 6) Modify equipment arrangement and facility resources to accommodate use by individuals with special needs

EXCM 382 Clinical Research: Methods, Design and Ethics w/Lab (3 Credit Hours)

Pre-requisites: EXCM 201 and STAT 103

Study of current literature with implications for exercise and sport science specializations; use of library resources and retrieval systems; evaluation of professional competencies.

EXCM 385 Kinesiology and Sports Biomechanics w/Lab (4 Credit Hours)

Pre-requisites: PHYS 112 and Anatomy & Physiology (GNUR 155/155L and GNUR 156/156L)

Analysis of human movement with emphasis on the biomechanics of exercise and sport movement patterns.

EXCM 387 Movement Anatomy in Exercise (3 Credit Hours)

Pre-requisites: EXCM 385

Concepts and principles from anatomy and biomechanics are integrated into the analysis of human movement. This course focuses on application of the principles of human movement for normal function and application to different levels of physical performance through case based applications and classroom activities. Content includes anatomical lever systems, moment arms, stability and laws of motion. Systematic analysis of human movement in clinical conditions, performance, and wellness settings will be reviewed. Development of individual plans to improve movement is woven throughout the course.

Outcomes:

At the successful completion of the course, the student will be able to: 1) Explain the relationship between biomechanics, anatomy and human movement; 2) Understand upper and lower limb musculoskeletal anatomy, physiology, and function; 3) Apply functional anatomy in the analysis of normal physical performance; 4) Develop individualized plans to correct movement based on the assessment of the individual; 5) Evaluate movement techniques in various populations; 6) Evaluate client outcomes as a result of prescribed exercise modifications to improve movement patterns

EXCM 390 Psychology of Health and Exercise (3 Credit Hours)

Pre-requisites: EXCM 201 and PSYC 273

This course will present current research with focus on the leading theories and applications in health and exercise psychology. The implications and applications of research and practice for health behavior change by health and fitness professionals in diverse populations at the societal and individual levels will also be reviewed.

EXCM 395 Clinical Internship and Patient Management (6 Credit Hours)

Pre-requisites: EXCM 201 and Anatomy & Physiology (GNUR 155/155L and GNUR 156/156L), 4 of 8 upper division EXCM courses

Practical experience working with exercise physiologists, physical therapists, occupational therapists, rehabilitation therapists, and others, in cardiac care and orthopedic rehabilitation.

This course satisfies the Engaged Learning requirement.

EXCM 399 Special Topics in Physical Therapy (2 Credit Hours)

This course covers the general areas of physical therapy, as well as a relevant topic in physical therapy. This course will be offered as an elective and open to all students. Recommend evidence-based practices using cases studies (ie exercise prescription, patient education, society level affects).

Outcomes:

Examine various research and writing to gain understanding and knowledge in the areas of physical therapy; Evaluate scientific literature; Explore the impact a physical therapist has on their patient through movement improvement, pain management and prevention

EXCM 401 Applied Physiology of Exercise (4 Credit Hours)

This course focuses on biologic system responses at rest, during exercise, and as the result of training. Major emphasis is placed on bridging gaps between introductory concepts of exercise physiology and the contemporary research evidence that further advances the field of exercise science. The effect of environmental systems and factors on the regulatory response to exercise is addressed. The history and major milestones associated with the development of the science of exercise physiology are presented. Future developments in the field of exercise physiology, such as the role of genetics and genomics are integrated into the course. Laboratory and field experiences provide students with opportunities to apply theory to practice.

Outcomes:

1) Describe major milestones, influences, and future directions in the development of the science of exercise physiology; 2) Explain the importance of the physiological adaptations that occur as a result of properly designed training programs; 3) Analyze measures of the physiology of respiration, circulation, energy production, metabolism, and muscle function in rest and exercise states; 4) Interpret research findings focused on cardiovascular, respiratory, metabolic and neuromuscular physiology in exercise science; 5) Perform selected laboratory and field tests of physiological function and physical fitness; 6) Interpret results from laboratory and field tests of physiological function and physical performance; 7) Differentiate positive training changes and signs and symptoms of overtraining among healthy individuals throughout the life cycle

EXCM 424 Motor Learning and Performance (3 Credit 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 motor behaviors. Major course concepts include information processing and decision making; speed, accuracy, and coordination; and knowledge and skill acquisition and transfer.

Outcomes:

1) Understand theoretical approaches that drive motor control and motor learning research; 2) Analyze principles and processes underlying movement skilled performance; 3) Analyze the human motor system and how it supports the acquisition and retention of complex movement skills; 4) Adapt instruction situations to achieve maximum performance and retention of learned skills; 5) Relate information processing and decision-making models to performance and movement

EXCM 435 Health Promotion and Wellness Theories and Frameworks (3 Credit Hours)

This course emphasizes health promotion in diverse and changing cultures and societies. Determining and influencing factors of health are examined from a cultural competence perspective. Major health promotion, wellness, behavioral, and lifestyle theories that influence the professional practice of exercise science in community settings are integrated throughout the course. The role of the exercise scientist in health education for the prevention and treatment of health problems, health promotion, and enhancing quality of life is emphasized.

Outcomes:

1) Relate concepts of health, health promotion, and wellness that influence individual and group health and quality of life; 2) Assess the health education and health promotion needs of individuals and groups in diverse populations; 3) Design culturally congruent health education, wellness, and behavioral modification programs, focused on improved health and quality of life, in community-based settings; 4) Implement health education, wellness, health promotion, and behavioral modification programming for diverse populations; 5) Evaluate health education, wellness, health promotion and behavioral modification programming in a variety of settings, using an outcomes-oriented approach; 6) Identify cultural, social, economic, and political influences on decision making and action in health and wellness

EXCM 444 Strength Training and Conditioning (3 Credit Hours)

This course focuses on the analysis of theory in the improvement of athletic performance, with specific emphasis on assessment and implementation of resistance training programs. Foundational knowledge in human physiology and biomechanics is applied to principles of speed, agility, power, flexibility, and technique development specific to individuals' goals. Principles of anaerobic and aerobic metabolism in relation to strength training and conditioning are a major focus in the course. This course provides foundational preparation for students interested in taking the National Strength and Conditioning Association Certified Strength and Conditioning Specialist's exam.

Outcomes:

1) Analyze the relation between resistance training and human performance; 2) Incorporate appropriate exercises, such as resistance training, medicine ball, balance, plyometric, and linear and lateral movement exercises into exercise prescriptions; 3) Differentiate between general fitness prescriptions and specific training to enhance athletic performance; 4) Evaluate biomechanical aspects of efficiency and performance; 5) Apply performance enhancement training principles to individuals' specific needs and goals

EXCM 450 Nutrition, Health and Performance (3 Credit Hours)

This course focuses on advanced concepts of nutrition as these relate to health, exercise, fitness, and performance. The role of micronutrients and macronutrients in major dimension of health and fitness are addressed. Advanced concepts in nutrient selection, metabolism, and timing are integrated into plans for supporting and improving health and performance. Collaborative practice with dietetics professionals and the interprofessional team in optimizing health, fitness, and performance capacity is a major unifying concept of the course.

Outcomes:

1) Attribute major functions of macronutrients and micronutrients to health, exercise, fitness and performance; 2) Apply principles of evidence-based nutrition to the food habits and practices of diverse individuals and populations; 3) Analyze energy and nutrient intake based on level of training and type of sport and exercise; 4) Understand roles and domains of practice of collaborating professions in promoting health, fitness and performance; 5) Develop interprofessional competencies to collaborate with nutrition professionals in optimizing nutrition for health, fitness, and performance

EXCM 454 Applied Sports Science (3 Credit Hours)

This course focuses on the application of science in the study of elite athlete sports performance. Advanced aspects of physiological monitoring, along with other athlete assessment tools will be examined. Special emphasis will be placed on the evidence-based, practical application of these various techniques, enabling a holistic approach to improving athlete health and performance.

Outcomes:

Identify the relation between cumulative stress and human performance; Plan periodized practices of strength and conditioning, sport training, nutrition, and psychological preparation to optimize performance in individual and team sport

EXCM 458 Cardiac and Pulmonary Disease and Rehabilitation (3 Credit Hours)

This course focuses on two prevalent areas of public health concern for the exercise scientist: cardiac and pulmonary health and disease. Emphasis is placed on prevention, etiology, pathophysiology, and understanding the diagnosis and treatment of cardiac and pulmonary disease. The role of the clinical exercise scientist in preventive and rehabilitative exercise intervention and programming to promote cardiac and pulmonary health is emphasized. Key factors in the development, management, and evaluation of cardiopulmonary rehabilitation programs are integrated into the course.

Outcomes:

1) Understand anatomy and physiology associated with cardiopulmonary health and disease; 2) Relate pathophysiology changes in cardiac and pulmonary disease to exercise prescription; 3) Explain diagnostic tests and procedures used in exercise assessment and intervention in cardiac and pulmonary health and disease; 4) Understand essential elements and phases of cardiac and pulmonary rehabilitation; 5) Design preventive exercise prescriptions for cardiac and pulmonary health in individuals and groups; 6) Design rehabilitative exercise prescriptions for patients with cardiac and pulmonary health alterations

EXCM 468 Application of Advanced Clinical Exercise Testing & Prescription (4 Credit Hours)

This course emphasizes theory, techniques, and procedures of clinical exercise stress testing for diagnostic and functional assessment of individuals. Students will develop competencies in clinical testing skills ranging from electrocardiography to graded exercise and physical performance testing. Data from diagnostic testing and functional assessments will be integrated into individualized exercise prescriptions, based on risk assessment and stratification. Responses to emergency situations in the exercise environment are addressed.

Outcomes:

1) Understand the signs, symptoms and scope of cardiovascular conditions, respiratory conditions, and metabolic conditions, and the development of these pathologies; 2) Apply risk assessment and stratification models in the diagnostic and functional assessment of individuals; 3) Evaluate the indications and contraindications of subject selection for testing, considering safety precautions, indications for test termination, and emergency procedures for conducting a graded exercise stress test; 4) Interpret results of exercise stress tests; 5) Differentiate normal and abnormal electrocardiographic responses to exercise of varying duration and intensity; 6) Design appropriate exercise test mode and protocols in consideration of client characteristics; 7) Understand responses to various emergency situations that may occur in exercise settings

EXCM 475 Exercise Applications in Special Populations (3 Credit Hours)

This course focuses on the advanced knowledge and competencies needed to evaluate health behaviors and risk factors in special populations across the lifespan. The administration of fitness assessments and the design, implementation, and evaluation of exercise programs in special populations are addressed. Exercise is approached as a therapeutic and treatment modality for individuals and groups with a variety of anatomic, physiologic, cognitive and sensory alterations.

Outcomes:

1) Understand the advanced physiology of growth and development, aging, and the pathophysiology of health conditions, disease and disability in special populations; 2) Analyze the effects of exercise training and nutrition on the underlying etiology and pathophysiology of acute and chronic conditions; 3) Prescribe exercise activities to optimize health and performance in special populations; 4) Adapt exercise prescriptions based on the individualized needs of individuals with anatomic, physiologic, or sensory challenges; 5) Evaluate the effectiveness of adaptations to exercise prescriptions and programming in special populations

EXCM 478 EKG Interpretation (0 Credit Hours)

This course will help students master the practical competencies of electrocardiography (EKG), including performing a 12-lead EKG, ambulatory monitoring, and the concepts of monitoring and interpreting an EKG with and without exercise stress testing. Additionally, this course will present content related to the cardiac cycle, EKG abnormalities, ectopy, and dysrhythmias, and identifying ischemia. Students will perform hands-on 12-lead EKG analysis at rest and with exercise and the steps required for ambulatory monitor testing.

EXCM 480 Advanced Exercise Assessment and Programming (3 Credit Hours)

This course focuses on principles of periodization applied to a performance enhancement setting. Major dimensions of the course include cycles and periods, peaking for competition, and rest and recovery. Periodization models and theories are examined, with a special emphasis on contemporary research findings that are applied to enhance athletic training and physical performance. Assessment of training programs based on performance requirements are a major emphasis throughout the course.

Outcomes:

1) Apply periodization models in the optimization of athletic or physical training and performance; 2) Analyze the relationship between training volume and intensity over time; 3) Analyze principles of program design for performance enhancement; 4) Evaluate testing approaches to the assessment of strength and conditioning; 5) Generate exercise program modifications for individuals based on youth development, injuries, and inexperience; 6) Relate variables of overload, variation, and specificity to strength and conditioning training

EXCM 482 Research Methods and Evidence in Exercise Science (3 Credit Hours)

This course prepares the student to understand scholarly inquiry, evaluate research evidence, develop evidence-based practices/ protocols, and generate knowledge for evidence-based practice in exercise and fitness. Methods of operationalizing scholarly inquiry include: understanding relations among theory, research, and practice; formulating research questions; identifying and appraising existing literature; critically evaluating research methodologies used in the study of an issue or problem; and applying research findings to exercise science practice. Social, cultural, political and ethical issues related to research are addressed, including special considerations of research conducted in exercise settings.

Outcomes:

1) Understand scholarly inquiry processes in relation to evidence-based practice and knowledge generation in the field of Exercise Science; 2) Formulate research questions that address clinical, educational, administrative, or policy issues for evidence-based practice in Exercise Science; 3) Understand the elements of various quantitative research designs; 4) Assess the adequacy of selected quantitative and qualitative designs in answering research questions in Exercise Science; 5) Evaluate extant evidence and theories relevant to knowledge gaps in the field of exercise science; 6) Analyze ethical issues and concerns in research related to Exercise Science

EXCM 485 Applied Biomechanics (4 Credit Hours)

This course will provide an analytical approach to the study of the human nervous system and human motion as applied to kinematic and kinetic analysis, study of anatomy, physiology, and mechanics.

Outcomes:

Students will use and apply laboratory measurement techniques commonly used in exercise science

EXCM 490 Special Topics in Exercise Science (1-3 Credit Hours)

Contemporary research, literature, projections and views as applied to fitness, nutrition, health, and well-being. Much of the learning that occurs in this course will be the result of group discussion. The topic areas covered will include fitness, nutrition, health, aging, obesity, and injuries. However, topics covered will largely be determined by student interests. Pre-requisites: Restricted to Parkinson School of Health Sciences and Public Health students.

Outcomes:

1) Understand research findings and scholarly writings in a specific topical area of Exercise Science; 2) Evaluate scientific and theoretical literature in a specific topic area of Exercise Science; 3) Direct scholarly discussion in a topical area of exercise science, with a focus on the individual, family, and community

EXCM 495 Advanced Exercise Science Internship (4 Credit Hours)

This course is designed to provide 200 hours of practical experience working with diverse individuals and populations under the supervision and guidance of a preceptor. Settings may include those which provide cardiac and pulmonary care, physical rehabilitation or sports performance. Required seminars focus on program planning and evaluation, and human and fiscal resource management. 1 credit hour is 50 clock hours of internship.

Outcomes:

1) Apply specialized skills and knowledge acquired in exercise science core courses in a practicum setting; 2) Work collaboratively with the interprofessional team; 3) Participate in planning sessions, meetings, and other activities of the professional staff in the field setting; 4) Evaluate the effectiveness of the exercise science interventions on the individuals or populations served