

APPLIED EXERCISE SCIENCE (AES)

AES-6000: Anatomy and Physiology (3 hours)

Investigation of the structure and function of the human body in a systematic fashion. An emphasis on the inter-relationships among the systems and the regulation of physiological functions to maintain homeostasis.

AES-6020: Kinesiology I (3 hours)

Students will explore upper extremity musculoskeletal anatomy with emphasis on systems that enable the human body to maintain proper stabilization and produce efficient movements. Students will develop human movement analysis techniques through assessment and evaluation of biomechanical movement patterns.

AES-6030: Kinesiology II (3 hours)

Students will explore trunk and lower extremity musculoskeletal anatomy with emphasis on systems that enable the human body to maintain proper stabilization and produce efficient movements. Students will develop human movement analysis techniques through assessment and evaluation of biomechanical movement patterns.

AES-6040: Biomechanics I (3 hours)

Application of mechanical principles to human movement with focus on the principles of kinematics and kinetics to the human body during movement. Prerequisite: B or higher in AES-6020 or AES-6030.

AES-6045: Biomechanics II (3 hours)

Apply principles of kinematics and kinetics of the human body in movement and sport activities. Prerequisite: B or higher in AES-6040.

AES-6050: Research Design and Methods in Exercise Science (3 hours)

Selected research techniques and designs utilized in exercise science research with emphasis on general statistics, interpretation of data, research ethics, scientific writing and library use.

AES-6200: Applied Exercise Physiology (3 hours)

Effects of exercise on the major systems of the human body, including cardiorespiratory, neuromuscular, glandular and digestive; with emphasis on optimizing human performance. Prerequisite: B or higher in AES-6050 or division chair consent.

AES-6250: Advanced Exercise Physiology (3 hours)

Advanced study of energy metabolism and the primary physiological systems (cardiovascular, respiratory, neuromuscular) in the context of exercise and performance. Advanced topics related to mechanisms and adaptations relating to physiology during exercise. Prerequisite: B or higher in AES-6050.

AES-6300: Exercise and Sport Nutrition (3 hours)

Explores the relationships between nutrition, energy metabolism, and exercise and sport performance, with an in-depth analysis of dietary and nutritional supplementation. Prerequisite: B or higher in AES-6050, and AES-6200 or AES-6250.

AES-6320: Vitamins and Minerals (3 hours)

Examination of the role and function of vitamins and minerals from physiological and clinical perspectives. Prerequisite: B or higher in AES-6300.

AES-6340: Nutrition and Exercise for Weight Management (3 hours)

Examines nutrition and exercise strategies for weight management with an emphasis on metabolic, physiological and psychological factors. Prerequisite: B or higher in AES-6320.

AES-6360: Practicum: Sports Nutrition (3 hours)

This course examines the planning and implementation of a sports nutrition program. Students are required to complete a nutrition assessment and planning case study on a member of their community. Prerequisite: B or higher in AES-6340.

AES-6380: Special Topics: Seminar in Sports Nutrition (3 hours)

In-depth study of selected advanced topics in sports nutrition. Prerequisite: B or higher in AES-6340.

AES-6400: Principles of Fitness and Health Promotion (3 hours)

Examines a systematic approach to personal training using the National Academy of Sports Medicine's Optimum Performance Training model. The course provides an overview of evidence-based principles of fitness assessment, program design, balance, flexibility, strength, stabilization and power. Designed to prepare students interested in becoming a Certified Personal Trainer through the National Academy of Sports Medicine (NASM). Prerequisite: B or higher in AES-6020 and AES-6030 or department chair consent.

AES-6420: Program Design in Fitness and Health Promotion (3 hours)

Explores program design principles for fitness and health promotion, with an emphasis on the National Academy of Sports Medicine's Optimum Performance Training model. Prerequisite: B or higher in AES-6400 or department chair consent.

AES-6440: Practicum: Fitness and Health Promotion (3 hours)

Planning and implementation of a fitness or health promotion program through a case study with a member of their community. Prerequisite: B or higher in AES-6420 or department chair consent.

AES-6460: Business Development and Entrepreneurship in Fitness and Health (3 hours)

Interfaces between human resource management, operations, marketing and entrepreneurship within the context of entrepreneurial, for-profit and non-profit fitness and health promotion ventures. Prerequisite: B or higher in AES-6440 or division chair consent.

AES-6500: Principles of Human Movement Science (3 hours)

Examines a systematic approach for identifying neuromusculoskeletal dysfunctions and the National Academy of Sports Medicine's Corrective Exercise Continuum. Designed to prepare students interested in becoming a Corrective Exercise Specialist through the National Academy of Sports Medicine (NASM). Prerequisite: B or higher in AES-6020 or AES-6040, and AES-6030 or AES-6045, and AES-6050, or division chair consent.

AES-6520: Program Design in Corrective Exercise Training (3 hours)

Explores program design principles for corrective exercise training, with an emphasis on the National Academy of Sports Medicine's Corrective Exercise Continuum. Prerequisite: B or higher in AES-6500 or division chair consent.

AES-6540: Practicum: Human Movement Science (3 hours)

Provides practical experience in planning and implementing a corrective exercise program through a case study with a member of their community. Prerequisite: B or higher in AES-6520 or division chair consent.

AES-6560: Special Topics: Seminar in Movement Science (3 hours)

In-depth study of selected advanced topics in human movement science. Prerequisite: B or higher in AES-6520.

AES-6600: Principles of Sports Performance Training (3 hours)

Examines a systematic approach to integrated performance training using the National Academy of Sports Medicine's Optimum Performance Training model. Designed to prepare students interested in becoming a Performance Enhancement Specialist through the National Academy of Sports Medicine (NASM). Prerequisite: B or higher in AES-6020 or AES-6040, and AES-6030 or AES-6045, and AES-6050, or division chair consent.

AES-6620: Program Design in Sports Performance Training (3 hours)

Explores program design principles for integrated sports performance training, with an emphasis on the National Academy of Sports Medicine's Optimum Performance Training model. Prerequisite: B or higher in AES-6600 or division chair consent.

AES-6640: Practicum: Sports Performance Training (3 hours)

Planning and implementation of an integrated sports performance training program through a case study with a member of their community. Prerequisite: B or higher in AES-6620 or division chair consent.

AES-6660: Special Topics: Seminar in Sports Performance Training (3 hours)

In-depth study of selected advanced topics in sports performance training. Prerequisite: B or higher in AES-6620 or division chair consent.

AES-6700: Principles of Exercise Testing, Prescription and Health Risk Appraisal (3 hours)

Practical application of the principles of exercise testing and prescription based on current practices in physiology and rehabilitation for normal and healthy individuals. Prerequisite: B or higher in AES-6200 or AES-6250, and AES-6040, and AES-6050.

AES-6770: Exercise Testing and Prescription for Special Populations (3 hours)

Practical applications of the principles of exercise testing and prescription based on current practices in physiology and rehabilitation for special populations including but not limited to: cardiopulmonary & metabolic disease patients, those with disabilities or chronic illnesses, children, elderly, and pregnant women. Prerequisite: B or higher in AES-6700.

AES-6780: Patient Education and Behavioral Change Strategies (3 hours)

Instruction of patient educational strategies and application of behavioral change techniques to encourage the adoption of healthy behaviors. Prerequisite: B or higher in AES-6700 and AES-6770.

AES-6810: Essentials of Strength Training and Conditioning (3 hours)

Explore the foundations of strength and conditioning as established by the National Strength and Conditioning Association (NSCA). Design and critique strength and conditioning programs based on NSCA guidelines. Designed to prepare students interested in becoming Certified Strength and Conditioning Specialist (CSCS) through the NSCA. Prerequisite: B or higher in AES-6020 or AES-6040, and AES-6030 or AES-6045, and AES-6050, or division chair consent.

AES-6820: Advanced Strength and Conditioning Theory (3 hours)

Explore the principles of resistance training and periodization. Develop periodized programs based on foundational and current literature. Critique and justify programming selections. Prerequisite: B or higher in AES-6810 or division chair consent.

AES-6830: Application of Advanced Strength and Conditioning (3 hours)

Identify and implement the dynamics and training principles of strength and power development based on appropriate research. Replaces: AES-6820. Prerequisite: B or higher in AES-6810.

AES-6840: Practicum: Strength and Conditioning Theory (3 hours)

Development and implementation of a strength and conditioning program through a case study with a member of the community. Justify your programming selection and assess program success. Prerequisite: B or higher in AES-6820 or AES-6830.

AES-6860: Seminar in Strength and Conditioning (3 hours)

In-depth exploration and analysis of advanced topics in strength and conditioning. Evaluation of current industry trends and practices. Creation of personal strength and conditioning philosophy. Prerequisite: B or higher in AES-6820 or AES-6830.

AES-6950: Independent Study in Applied Exercise Science (1-6 hours)

AES-6990: Capstone Experience (3 hours)

Culminating experience in the Master of Science in Applied Exercise Science degree. Experiences may include, but are not limited to, independent research that leads to an actual product such as a publishable journal article, professional field experience, conference presentation, advanced certifications, program or facility development, website, online course materials, curriculum development. Prerequisite: B or higher in AES-6380, AES-6460, AES-6560, AES-6660, AES-6780 or AES-6860.