APPLIED PHYSIOLOGY AND KINESIOLOGY

APK 5102 Kinetic Anatomy 3 Credits
Grading Scheme: Letter Grade
Will provide in-depth coverage of musculoskeletal anatomy as a foundation for learning components of simple and complex motor tasks, with an emphasis on proper execution and analysis of joint movement and common exercises.

APK 5121 Anatomy and Physiology for Sport and Exercise Science 3 Credits
Grading Scheme: Letter Grade
Studies human anatomy and physiology from an organ-systems approach with direct applications to exercise, sport, training, and clinical practice. Serves as a foundation for learning and applying more advanced principles and concepts related to biomechanics, exercise physiology, and applied kinesiology by using an integrated approach to discuss topics of cell, tissue, and organ structure and function.
Prerequisite: Graduate Level Standing.

APK 5127 Assessment in Exercise Science 3 Credits
Grading Scheme: Letter Grade
Techniques and methodologies to assess health and physical fitness.
Prerequisite: PET 3351C or equivalent.

APK 5133 Human Pathophysiology for the Exercise Sciences 3 Credits
Grading Scheme: Letter Grade
Macrotraumatic and microtraumatic inflammatory processes, factors affecting inflammation and healing, and the role of exercise in controlling the onset or course of an inflammatory response.
Prerequisite: PET 2320C, 2350C, 3351C.

APK 5150C Clinical Anatomy for the Exercise Sciences 3 Credits
Grading Scheme: Letter Grade
Designed for students to learn advanced dissection skills from a whole systems approach with the intent of practical application. The primary focus will involve human cadaver dissection. The role of anatomical structures as they relate to musculoskeletal injury mechanisms, evaluation, and rehabilitation will be emphasized.
Prerequisite: (APK_BS or APK_MS) & (APK 2100c or equivalent).

APK 5166 Sports Supplements 3 Credits
Grading Scheme: Letter Grade
This course covers sport supplements and their effects on athletes. We examine aspects of diet and how supplements can influence different components. Then the history of sports supplements will be reviewed along with regulations that govern them. Lastly, supplements that are currently being used throughout the world will be discussed.
Prerequisite: APK 3110C with a minimum grade of C.

APK 5171 Clinical Exercise Prescription 3 Credits
Grading Scheme: Letter Grade
Dedicated to creating exercise prescriptions specifically tailored for various health-related conditions. Students will examine assessments and exercise programming for aerobic, resistance, balance, flexibility, and movement-related aspects of health and fitness. The class will culminate in a module focused on the pharmacology associated with various health conditions and their interaction with exercise interventions.

APK 5177 Strength and Conditioning for Beginning Practitioners 3 Credits
Grading Scheme: Letter Grade
This course addresses the principles of designing training programs of varying duration aimed at improving muscular strength, power, speed, agility, endurance, balance, stability, and hypertrophy. Emphasis will be placed on creating and administering evidence-based periodized training programs and ensuring safe and productive technique of fundamental exercises in each modality.
Prerequisite: Must be enrolled in applied physiology and kinesiology (APK) degree program.

APK 5404 Sport Psychology 3 Credits
Grading Scheme: Letter Grade
Survey of current research, learning processes, motivation, performance intervention, strategies, group dynamics, history of sport psychology, and other topics.
Prerequisite: Consent of instructor.

APK 5620 Genetics of Human Performance 3 Credits
Grading Scheme: Letter Grade
Introduces genomics, genetics principals, and technologies related to sports and human performance. Role of genetic variation in power, endurance, trainability, and injury. Role of sex and gender in sport performance.
Prerequisite: Restricted to APK_BS or APK_MS students.

APK 5702 Applied Sport Science 3 Credits
Grading Scheme: Letter Grade
Examines fundamental concepts related to the acquisition, analysis, and interpretation of data relevant to the outcome of human performance across myriad physical and cognitive domains including sport, exercise, tactical operations, and medical professions. Addresses the use of statistics and broader fields of data science, artificial intelligence, analytics, and technology management necessary to evaluate performance and strategically adjust training methods to enhance performance.
Prerequisite: Required major of Applied Physiology & Kinesiology.

APK 6116C Physiological Bases of Exercise and Sport Sciences 3 Credits
Grading Scheme: Letter Grade
Applying fundamental concepts of human physiology to programs of physical education and sports. Recent research developments in sports physiology.

APK 6118 Neuromuscular Adaptation to Exercise 3 Credits
Grading Scheme: Letter Grade
Research developments; and describing neural and muscular function and adaptation to acute and chronic exercise.
Prerequisite: APK 6110C.

APK 6124 Extreme Environment Physiology 3 Credits
Grading Scheme: Letter Grade
Examine the responses of the body during and after exposure to extreme environmental conditions. Topics include high-altitude, deep-water diving, extreme temperature environments, microgravity/outer space, and high-stress environments. The course will have sections detailing possible diseases and conditions relating to exposure to those extreme environments.

APK 6145 Movement Disorders 3 Credits
Grading Scheme: Letter Grade
Covers the sensory and motor systems of the nervous system responsible for regulating movement in movement disorders. We cover movement disorders including Parkinson's disease, tics, Huntington's disease, dystonia, tremor, spinal cord injury, spasticity, cerebellar disorders, and speech and language disorders.

APK 6167 Nutrition Aspects of Human Performance 3 Credits
Grading Scheme: Letter Grade
Offers an overview of the roles nutrient selection, metabolism, and timing play in supporting and improving physical performance. Evidence-based strategies and recommendations are applied to industry specific examples. Course concepts aid in preparation for certification exams within the exercise sciences that include nutrition as a component.
Prerequisite: MS APK Student OR MS APK Certificate Student.

APK 6170 Advanced Exercise Physiology 3 Credits
Grading Scheme: Letter Grade
Covers advanced concepts in integrative physiology and exercise focusing on metabolism and endocrine exercise physiology, skeletal muscle contraction and fatigue, cardiovascular and hemodynamics regulations, and respiratory exercise physiology. The course emphasizes acute responses to exercise and environmental challenges in both health and disease.
Prerequisite: APK4112 or APK6116C or equivalent or instructor approval

APK 6176 Strength and Conditioning for Advanced Practitioners 3 Credits
Grading Scheme: Letter Grade
Addresses advanced physiological, biomechanical, and exercise program design principles relevant to the practice of strength and conditioning. Emphasis is placed on making informed decisions from available data when designing training programs to optimize athletic performance. Prepares students for advanced strength and conditioning certification exams through various professional associations.

APK 6195 Cell Physiology & Biophysics 0 Credits
Grading Scheme: Letter Grade
Provides a solid understanding of the molecular basis that controls cellular physiology. Emphasis is placed on understanding the basic tenets of genome structure/function and gene expression, protein synthesis and gradation, cell cycle/division and death, cytoskeleton, and cellular metabolism. Attention is placed on understanding the cellular physiology responses to exercise.

APK 6205C Nature and Bases of Motor Performance 3 Credits
Grading Scheme: Letter Grade
Principles of motor skill development, and conditions affecting motor skill development and retention in physical education activities.

APK 6206 Planning Motor Actions 3 Credits
Grading Scheme: Letter Grade
Processes and mechanisms involved in planning voluntary human motor actions. Variables that influence movement planning and initiation.
Prerequisite: consent of instructor.

APK 6225 Biomechanical Instrumentation 3 Credits
Grading Scheme: Letter Grade
Overview of data collection and analysis tools. Hands-on experience conducting projects using EMG, videography, and force transducer technology.
Prerequisite: APK 6220C.

APK 6226C Biomechanics of Human Motion 3 Credits
Grading Scheme: Letter Grade
Applying the principles of statics, kinematics, and kinetics to kinesiological systems of the human body in movement and sports skills.
Prerequisite: PET 2320C; MGF 1202 or MAC 1142.

APK 6320C Corrective Exercise 3 Credits
Grading Scheme: Letter Grade
Examines fundamental concepts of human movement and movement impairments on musculoskeletal injury risk. Includes evidence based program design and practical skills necessary to successfully identify and correct movement impairments in active populations. Content will prepare students to sit for the National Academy of Sports Medicine Corrective Exercise Specialist certification.
Prerequisite: HH College

APK 6406 Exercise Psychology 3 Credits
Grading Scheme: Letter Grade
Overview, examining research evidence on psychological factors associated with adapting and maintaining an exercise program.

APK 6408 Performance Enhancement 3 Credits
Grading Scheme: Letter Grade
Mental and psychological techniques and strategies to improve performance and achievement in sport and exercise.
Prerequisite: APK 5404.

APK 6417 Attention & Emotion in Tactical Athlete Populations 3 Credits
Grading Scheme: Letter Grade
Covers the fundamental links between emotion and attention, and the role these psychological factors play influencing motivation, behavior, decision-making, and human movement in elite performance within physically and psychologically demanding tactical performance environments.

APK 6611 Tactical Strength & Conditioning 3 Credits
Grading Scheme: Letter Grade
Examines fundamental concepts in bioenergetics, biomechanics, cardiopulmonary responses, and skeletal muscle function adaptation. Includes evidence based program design and practical skills in fire and rescue, law enforcement, and military careers. Content prepares students to sit for the National Strength and Conditioning Association (NSCA) Tactical Strength and Conditioning Facilitator certification.
Prerequisite: HH College.

APK 6704 MATLAB for Biomedical Sciences 3 Credits
Grading Scheme: Letter Grade
This course introduces MATLAB foundations to code, compute, analyze, and plot research data in biomedical sciences. Each week, the course consists of a 1-hour didactic lecture and a 2-hour lab session dedicated to Q As and troubleshooting non-working codes.

APK 6715 Grant Writing in Health & Human Performance 3 Credits
Grading Scheme: Letter Grade
Acquaints students with grant submission requirements. We will focus on NIH predoctoral (F31) specific aims and research strategy, but more general grant writing tips and approaches will also be discussed. Topics and examples will cover health and human performance. The course will conclude with the formation of “study sections” to peer review proposals.
Prerequisite: There are no prerequisites for this course, but doctoral student status is strongly recommended.

APK 6725 AI for Sport & Movement Sciences 3 Credits
Grading Scheme: Letter Grade
Applies AI technologies to the study of sport movement sciences in healthy and diseased human populations. This course introduces students to programming and data visualization techniques while covering classical concepts of machine learning (e.g. linear regression and classification, ensemble-based algorithm, clustering, and neural networks) and modern machine learning methods for images and video processing (e.g. convolutional neural networks and transformers)

APK 6900 Directed Independent Study 1-5 Credits, Max 12 Credits
Grading Scheme: Letter Grade
Individual research projects under faculty guidance.

APK 6940 Advanced Practicum in Exercise and Sport Science 3-6 Credits, Max 6 Credits
Grading Scheme: Letter Grade
On-site practical experience in exercise and sport science.
Prerequisite: Limited to students enrolled in the MS APK degree concentration in Strength and Conditioning Practitioner.

APK 7107 Cardiovascular Exercise Physiology 3 Credits
Grading Scheme: Letter Grade
Basic mechanisms of cardiovascular dynamics at rest and in response to exercise.
Prerequisite: APK 6110C/6356L or equivalent.

APK 7108 Environmental Stress Exercise Physiology 3 Credits
Grading Scheme: Letter Grade
Energetics of environmental stress on cardiovascular, respiratory, metabolic, and muscle physiology as they pertain to physical performance.
Prerequisite: APK 6110C/6356L or equivalent.

APK 7117 Exercise Metabolism 3 Credits
Grading Scheme: Letter Grade
Principles of metabolic regulation during exercise; effects of chronic exercise on muscle metabolism.
Prerequisite: APK 6110C or equivalent.

ATR 6124 Clinical Anatomy for the Exercise Sciences 3 Credits
Grading Scheme: Letter Grade
Cadaver dissection and lectures. Appreciation of clinical applications of anatomical knowledge for those pursuing careers in exercise science fields.
Prerequisite: PET 2320C, 2350C, 3351C.

ATR 6215 Evidence-Based Orthopedic Exam I: Upper-Extremity 3 Credits
Grading Scheme: Letter Grade
Identifying, evaluating, and managing acute athletic injuries.
Prerequisite: for students who are BOC-certified athletic trainers.

ATR 6216 Evidence-Based Orthopedic Exam II: Lower-Extremity 3 Credits
Grading Scheme: Letter Grade
Orthopedic and biomechanical assessment of lower-extremity function and dysfunction. Students develop skills and study the principles and procedures used in advanced evaluation techniques. Students examine components of lower-extremity function from biomechanical, neuromuscular and anatomical perspectives. Topics include advanced orthopedic special tests, 3-dimensional kinematics, interpreting contemporary diagnostic tests and treatment of lower-extremity pathology/dysfunction and critical reviews of related research.
Prerequisite: ATR 6215

ATR 6304 Rehabilitation and Modalities of Athletic Injuries 3 Credits
Grading Scheme: Letter Grade
Rehabilitation and therapeutic modalities in the field of athletic training.

ATR 6624 Athletic Training Research and Technology I 3 Credits
Grading Scheme: Letter Grade
Current theory and practical application of techniques (cardiovascular testing, isokinetic strength testing, and EMG testing) for understanding and designing research projects related to athletic training and sports medicine.

ATR 6625 Athletic Training Research and Technology II 3 Credits
Grading Scheme: Letter Grade
Current theory and practical application of techniques (modalities in research, proprioception testing, and force plate and balance testing) for understanding and designing research projects related to athletic training and sports medicine.
Prerequisite: NATA certified or eligible, or related degree or certification.

ATR 6934 Seminar in Athletic Training 3 Credits, Max 5 Credits
Grading Scheme: Letter Grade
Research topics or contemporary issues in athletic training.
Prerequisite: NATA certification.

HLP 6515 Evaluation Procedures in Health and Human Performance 3 Credits
Grading Scheme: Letter Grade
Evaluation and interpretation of tests and analysis of research data.

HLP 6535 Research Methods in Health and Human Performance 3 Credits
Grading Scheme: Letter Grade
Introduction to research methodology and design.

HLP 6911 Research Seminar 1 Credit
Grading Scheme: S/U
Research presentations by graduate students and faculty in the College.

HLP 6935 Variable International Topics 1-6 Credits, Max 15 Credits
Grading Scheme: Letter Grade
Opportunity to study in a wide range of cultural settings.
Prerequisite: adviser's approval.

HLP 7939 HHP PhD Professional Development Seminar 3 Credits
Grading Scheme: Letter Grade
Designed to complement the scholarly emphases of the HHP PhD program by providing insight into key considerations for professional development and personal growth. Best practices will be shared for developing professional aptitude and the skills necessary for successful matriculation through graduate studies and future professional careers.

HLP 7979 Advanced Research in Health and Human Performance 1-12 Credits
Grading Scheme: S/U
Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field, or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy.

HLP 7980 Research for Doctoral Dissertation 1-15 Credits
Grading Scheme: S/U
Research for Doctoral Dissertation

PET 5064 Athlete Sexual Health and Wellness 3 Credits
Grading Scheme: Letter Grade
Explore the ways sexual agency, sexual misconduct, healthcare services for athletes, and other related topics directly impact athlete wellness and how sexual health is made a priority alongside physical, psychological, and financial health.
Prerequisite: 7HH or 8HH

PET 5936 Special Topics/Seminars 1-3 Credits
Grading Scheme: Letter Grade
Special Topics/Seminars

PET 6910 Supervised Research 1-5 Credits, Max 5 Credits
Grading Scheme: S/U
Supervised Research

PET 6947 Graduate Internship in Exercise and Sport Sciences 3-9 Credits, Max 9 Credits
Grading Scheme: S/U
On-site full-time practical experience in field of study.
Prerequisite: completion of 2 terms of course work applicable to specialization; permission of adviser, written application, and site approval.

PET 6971 Research for Master's Thesis 1-15 Credits
Grading Scheme: S/U
Research for Master's Thesis