KINESIOLOGY (KINES)

KINES 530: Experimental Design and Methodology in Kinesiology
3 Credits
Research techniques, including methods, research design, techniques for data collection, as applied to relevant problems in Kinesiology.
Prerequisite: 3-credit 400-level statistics course

KINES 531: Issues in Athletic Training
3 Credits
Analysis of professional/academic issues related to athletic training; includes medical considerations, legal and professional developments, and current research.

KINES 540: History of Sport: Cultural and Social Dynamics
3 Credits
This seminar explores the literature, methodologies, theoretical challenges, and research questions confronting the field. KINES 540 History of Sport: Cultural and Social Dynamics (3) The History of Sport: Social and Cultural Dynamics explores the significant literature, key methodologies, and major questions currently confronting scholars of sport and leisure. The class will survey a variety of national sporting cultures and a wide range of topics. Students will read works in major research areas in the field. They will debate arguments and issues raised in those readings. They will write critiques of their readings. Students will undertake several research expeditions. The expeditions familiarize the students with the resources available at Penn State and other libraries and archives. The research expeditions also introduce them to the scholarly tools necessary for undertaking research in the social and cultural dynamics of sport. They will also produce a primary-source based research paper on a topic that they select in consultation with the professor. This course seeks to prepare graduate students to explore the history of sport. The course also seeks to develop the basic academic skills necessary for success in scholarly endeavors. Students will read, debate, and write. Writing assignments include journal article summaries, book critiques, and a research paper. The completed research paper should serve as a platform for producing a conference presentation and/or journal publication.

KINES 551: Seminar in Motor Control
3 Credits
The course will address contemporary theories and methods in motor control as reflected in recently published scientific papers.

KINES 565: Neurophysiological Basis of Movement
3 Credits
The basic understanding of neurophysiological structures and mechanisms involved in the generation of human voluntary movement.

KINES 566: Psychophysiology of Movement
3 Credits
Basic concepts and principles of psychophysiology and their application for analyses of human movements.

KINES 567: Advanced Exercise Physiology
3 Credits
Physiological changes during exercise with emphasis on the effects of physical conditioning and training.
Prerequisite: BIOL 472, EXSCI 480
Cross-listed with: PHSIO 567

KINES 575: Experimental Methods in Biomechanics and Motor Control
3 Credits
Introduces the theory and practice behind the primary experimental methods used in biomechanics and motor control. KINES 575 Experimental Methods in Biomechanics and Motor Control (3) Biomechanics and motor control share a common methodology for recording and analyzing human movement. This course is designed to introduce students to the theory and practice behind the primary experimental methods used in biomechanics and motor control. At the end of the course students should have an increased understanding of the experimental methods used in biomechanics and motor control, and experience at implementing these methods. Topics to be covered include: signal processing, electromyography, motion analysis, force measurement, anthropometry, joint kinematics in two- and three-dimensions, joint kinetics, modeling, error propagation, and scaling and dimensional analysis. Lectures will be used to introduce students to the theory behind a measurement technique. Readings will be used to provide supplementary examples of how these techniques are applied in the analysis of human movement. The techniques will be illustrated with MATLAB routines, with data sets provided so the students can experience how the data must be manipulated to provide meaningful results. Assessments will focus on students understandings of the techniques, their implementation, and interpretation of their output. The course will provide a solid foundation for students wanting to understand how the data they are reading about has been produced, and the limitations in such data. Students will also have the background required to become independent in their data collection and processing in the analysis of human movement in both biomechanics and motor control. Evaluation will include exams, class presentations and a portfolio. It is anticipated that this course will be offered every spring semester with a maximum enrollment of 15.
Prerequisite: 3-credit 400-level biomechanics or motor control class

KINES 577: Cardiovascular Physiology
3 Credits
In-depth study of the heart and circulatory system with emphasis on the effects of exercise on cardiovascular function.
Prerequisite: KINES 484
Cross-listed with: PHSIO 577
KINES 578: Physiology and Mechanical Behavior of Skeletal Tissues
3 Credits
In-depth examination of the structure, composition, and material behavior of the basic skeletal tissues, including bone, cartilage, tendon, and ligament.  
**Prerequisite:** BIOL 421, BIOL 472

KINES 579: Advanced Biomechanics of Human Motion
3 Credits
Biomechanical foundation of human movement and injury prevention.  
**Prerequisite:** KINES484; MATH 141 or MATH 220

KINES 588: Scientific Writing in Kinesiology
3 Credits
Instruct students in writing grant proposals, abstracts, manuscripts, and effective presentations in their respective scientific fields of study in Kinesiology. KINES 588 Scientific Writing in Kinesiology (3) This course is intended to assist graduate students in writing grant proposals, abstracts, and manuscripts, as well as preparing effective presentations in their respective scientific field of study within the discipline of Kinesiology. Course objectives are to: 1. Increase technical proficiency in scientific writing, in terms of grammar, sentence structure, formatting, etc. 2. Promote the ability to write effective specific aims, hypotheses, and background statement portions of a grant proposal. 3. Understand the formulaic approach to writing effective scientific abstracts and manuscripts. 4. Expand the ability to prepare and present effective oral communications using a PowerPoint format. 5. Develop an understanding and appreciation for the peer review process associated with grant proposals and manuscripts. Evaluation will be based on grading the following brief writing assignments: a manuscript abstract, the Introduction section of a manuscript, the Specific Aims page of an NIH-style grant proposal, and a set of PowerPoint slides for an abbreviated oral presentation. The course is to be offered every fall semester. Enrollment is limited to Kinesiology Department graduate students.

KINES 590: Colloquium
1-3 Credits/Maximum of 3
Continuing seminars which consist of a series of individual lectures by faculty, students or outside speakers.

KINES 590B: Exercise Physiology Colloquium
1 Credits/Maximum of 4
Continuing colloquia in exercise physiology which consists of individual lectures by outside speakers, students and faculty.

KINES 594: Research Topics
1-18 Credits/Maximum of 18
Supervised student activities on research projects identified on an individual or small-group basis.