UNIVERSITY OF BRITISH COLUMBIA
SCHOOL OF KINESIOLOGY

KIN 343: Biology of Human Athletic Performance
Fall 2019

Course Coordinator: Dr. Kramer
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Lecture: Monday, Wednesday, Friday 15:00 to 16:00 UBC Life Building 2201

COURSE DESCRIPTION:

Performance in athletic events requires complex coordination of multiple organ systems. What physical attributes distinguish the elite endurance athlete vs. the sprinter vs. the gymnast? Kinesiology is the study of the physiological, biomechanical, and psychosocial mechanisms contributing to the performance of human movement, athletic performance and our response to exercise. This course will provide an overview of these realms of study, drawing on applications in athletic performance and health. The course will be led by an array of faculty and professional leaders in the fields of exercise physiology, neuroscience, biomechanics, sports medicine, nutrition, and psychology pertaining to the human movement and exercise sciences.

LEARNING OUTCOMES:

The overall goal of the course is to introduce students to the biological aspects underlying human movement and exercise as they pertain to athletic performance, sport, and fitness and health. Students will be provided with a basic understanding of the physiology and anatomy pertaining to the control of movement (nervous system and muscle), the cardiorespiratory and metabolic responses to exercise (heart and lungs, muscle, and metabolism), and the adaptations to training that build endurance, strength, and power. Building on these fundamental concepts, students will then examine the impact of different extrinsic and intrinsic factors affecting performance, including diet and nutrition, psychology, and the environment. Throughout the course, students will be encouraged to integrate the course content as well as develop the ability to apply the information to "real life" scenarios. A secondary learning objective is to develop skills related to reading and interpreting scientific articles in the area of kinesiology.

COURSE READINGS:

There is no textbook for this course. Each week, a scientific paper will be assigned, which students are expected to access independently using Pubmed. Instructions on using Pubmed will be provided

in the first scheduled tutorial. Lecture materials will be provided, as appropriate, through the course website on Canvas.

COURSE EVALUATION:

Tutorials (11 quizzes) – 25%
Midterm – 35% (October 18, in class)
Final – 35% (scheduled during final examination period, December 3 to December 18)

LECTURE SCHEDULE:

Date	Topic	Lecturer
Sept-4	Course introduction	Dr. Kramer
Sept-9 Sept-11 Sept-16 Sept-18	Anatomy and physiology of movement	Dr. Linde Archibald (Kramer Lab) Dr. Chua Mildren (Inglis Lab)
Sept-23 Sept-25 Oct-2 Oct-4	Physiology of endurance performance	Dr. Sheel Dr. Koehl Dr. Boushel
Oct-7 Oct-9	Nutrition and	Dr. Mitchell
Oct-16	Review	Dr. Kramer
Oct- 21 Oct-23 Oct-28 Oct-30	Biomechanics and balance	Dr. Blouin TBD Malik (Lam Lab) Dr. Kramer
Nov-4 Nov-6 Nov-13	Metabolic effects of resistance training	Dr. Gallo
Nov-18 Nov-20	Psychology of exercise	Dr. McEwen
Nov-25 Nov-27	Pain and stress in athletic performance	McDougall (Kramer Lab) Luke (Putterman Lab)
Nov-29	Review	Dr. Kramer

*Please note there is no lecture on October 14 (Thanksgiving Day) or November 11 (Remembrance Day).

TUTORIALS:

A relevant scientific article related to that week's lecture material has been assigned (see below). Students are responsible for accessing and reading the article. After a brief class discussion, a quiz will be available online through Canvas. The quiz will be accessible until midnight (11:59PM) on the day of the tutorial. Tutorials will generally be held in class on Fridays. The exception is the week of September 30th, where the tutorial will take place on Monday (i.e., ahead of lecture material).

TUTORIAL READINGS:

Date	Topic	PMID
Sept-13	Effects of resistance training on neuromuscular junction morphology	11003794
Sept-20	Patterned ballistic movements triggered by a startle in healthy humans	10200438
Sept-27	Sildenafil does not improve performance in 16.1 km cycle exercise time-trial in acute hypoxia	30653578
Sept-30	Influence of Hyperoxic-Supplemented High-Intensity Interval Training on Hemotological and Muscle Mitochondrial Adaptations in Trained Cyclists	31258485
Oct-11	Divergent effects of cold-water immersion versus active recovery on skeletal muscle fiber type and angiogenesis in young men.	29466686
Oct-25	Down regulation of vestibular balance stabilizing mechanisms to enable transition between motor states	29989550
Nov-1	Feasibility of sensory tongue stimulation combined with task-specific therapy in people with spinal cord injury: a case study	24906679
Nov-8	Aerobic exercise and neurocognitive performance: a meta-analytic review of randomized controlled trials	20223924
Nov-15	Exercise and acute cardiovascular events placing the risks into perspective: a scientific statement from the American Heart Association Council on Nutrition, Physical Activity, and Metabolism and the Council on Clinical Cardiology	17468391
Nov-22	Adolescent athletes: psychosocial challenges and clinical concerns	22569310
Nov-29	Aerobic exercise lengthens telomeres and reduces stress in family caregivers: A randomized controlled trial	30266522

SCHOOL OF KINESIOLOGY COURSE POLICIES:

1. Full attendance is expected to all sessions. Students must participate in a mature fashion in class and are expected to show respect for their fellow students and the instructors. Disruptive behavior will not be tolerated in the classrooms.
2. The University accommodates students with disabilities who have registered with Access & Diversity. Students whose attendance or academic performance may be severely affected by medical, emotional, or other disabilities should consult with the instructor at least 2 weeks before scheduled tests or exams to discuss any special accommodations that might be needed in order to complete course requirements. Supportive documentation from either Access & Diversity or a physician will be required by the Undergraduate Advising Office.
3. The University accommodates students whose religious obligations conflict with attendance or scheduled tests and examinations. Any accommodations should be communicated to the course instructor, preferably in the first week of class.
4. Graded work in this course constitutes the lecture tests, laboratory tests, and final examinations. Your attendance at these tests is mandatory. Students must complete these evaluations on the scheduled date. Students who miss any of these evaluations due to unauthorized absence will receive a grade of zero. Students who cannot complete the graded work due to an authorized absence will write a makeup test on a date to be determined in consultation with the instructor.
5. Authorized Absences: Students who know in advance that they will be unavoidably absent should appeal for special accommodation from the instructor as early in the term as possible to determine how any missed graded work will be completed. The School of

Kinesiology will not normally consider special accommodation without timely notification. A minimum of two weeks notification is expected and documentation will be required.

6. Where prior notification of absence from graded work is not possible (e.g. due to unforeseen illness or family crisis), students should contact the instructor as soon as possible upon their return to class. Supportive documentation, submitted to the Undergraduate Advising Centre, will be requested.
7. Students who miss the final examination in December MUST apply to the undergraduate Advising Office at the earliest possible date to request consideration for Academic Concession. Students will be asked to complete an Academic Concession Form and provide supportive documentation. Academic Concession is a privilege, not a right, and can be granted only by the Undergraduate Advising Office.
8. Students who plan to be absent from graded work for varsity athletics, family obligations, or other similar commitments, cannot assume they will be accommodated, and should discuss their commitments with the instructor before the official course drop date.