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Spring, 2012

KIN 256 - Environmental Exercise Physiology

Course Description

Survey and critical evaluation of current concepts and literature regarding various environmental (heat, cold, altitude, etc.) conditions as they affect the typical responses to exercise. Both acute effects and chronic adaptations will be examined.

Prerequisites

KIN 155 - Exercise Physiology or equivalent.

Course Objectives

Upon successful completion of this course, students will:

1. demonstrate an understanding of the current concepts and research literature in the area of environmental effects on physical work capacity and physiological responses to exercise.
2. demonstrate an understanding of the limitations imposed by the environment on human performance.
3. sensitively identify and explain age, gender, cultural, and other individual differences that may exist in acute physiological responses, chronic adaptations, and performance capabilities under various environmental extremes.
4. demonstrate proficiency in the ability to read, understand, and critically evaluate the literature in environmental exercise physiology.
5. demonstrate skill in writing abstract summaries of published research articles and a review of literature.
6. have acquired the skills which will enable them to integrate and synthesis physiological principles and concepts related to environmental factors into coherent models and apply these models in the evaluation of factors limiting human performance.
7. demonstrate skill in oral presentations of abstracts and review of literature topic.
8. have had the opportunity to participate in the exchange of new ideas and concepts in the area of environmental exercise physiology.

Course Procedures

This course will be conducted both as lecture and as a seminar. Each class period will consist of both a lecture and discussion over the assigned readings for the week. In addition, the research articles abstracted by the students will be presented and integrated into the discussion portion of the class. Students should be prepared to discuss and exchange the information in their abstracted articles and their ideas with the other students during the discussion portion of class. Effective utilization of these course procedures should enhance the development of an advanced knowledge and understanding of environmental exercise physiology within the students during the semester.

Course Requirements

1. Course Materials: Cheung, S.S. (2010). Advanced Environmental Exercise Physiology. Champaign, IL: Human Kinetics.
Cisar, C. J. (2005). Environmental Exercise Physiology Notebook. San Jose, California: Maple Press (available at Maple Press, 481 East San Carlos).

2. Students will be required to read two research articles pertaining to current weekly topics during the semester. Students will be required to submit a brief abstract of each article indicating the purpose, methods, results, conclusions, strengths and weaknesses (if any), and practical applications of the research study. Students should submit a copy of the research article along with the prepared abstract. Students are responsible for making a copy of their abstracts for each of the other students in the class. The abstracted article must directly relate to the topic for the week in which it is prepared and submitted. Only one abstract can be submitted for credit on a given weekly topic. Students are expected to present a brief PowerPoint overview and discuss their abstracted articles with the other students in the class as well as relate their abstracted articles to the weekly lecture topic.
3. A review paper, which identifies and focuses on at least one environmental factor limiting human performance will be written. The review of literature should focus on the physiological mechanisms affected by the environmental factor(s). The review paper should contain a minimum of 10 primary (refereed) references and these references should be integrated into a physiological model, which has application and implications for an area of physical performance. Citation of the actual data collected in research studies is desirable when appropriate. The review paper must be an original paper written exclusively for this course. Referencing and text citations should be done in American Psychological Association (APA) format. The paper should be double-spaced, typed, and approximately 10-12 pages in length. Student should submit an electronic copy of the paper for grading. In addition, students should type a brief abstract of their paper and copies of the abstract will be distributed to the other members of the class. Also, a copy of the abstract should be included in the front of the paper submitted for grading. It is recommended that students discuss and clear their topic with the instructor prior to writing the review paper. The electronic submission of the paper is due on or before the beginning of class on May 15, 2012. Electronic submission of the paper will not be accepted late. Students will present a brief informal summary presentation of their review paper to the class. Grades for the review paper and presentation will be based on the following criterion: quality of paper abstract, purpose of assignment, organization of paper, grammar and spelling in paper, paper introduction, body of review in the paper (content depth and quality as well as inclusion of data-based research), paper summary, citations and references within the paper, utilization of primary (refereed) research articles, and presentation of the paper on May 15, 2012.
4. Two written examinations will be given during the course. The second examination will not be cumulative. Both examinations will consist of objective examination questions (i.e., multiple choice, matching, and true-false questions).
5. ACADEMIC INTEGRITY (from Office of Judicial Affairs). “Your own commitment to learning, as evidenced by your enrollment at San Jose State University, and the University’s Academic Integrity Policy requires you to be honest in all your academic course work. Faculty are required to report all infractions to the office of Judicial Affairs. The policy on academic integrity can be found at <http://www2.sjsu.edu/senate/S04-12.htm>.
6. AMERICANS WITH DISABILITIES ACT COMPLIANCE. “If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with The Disability Resource Center (924-6000, located in Adm 110) as soon as possible. Presidential Directive 97-03 requires that students with disabilities register with DRC to establish a record of their disability.”

Course Evaluation

Grading will be as follows:

Two written examinations (25% each)	50%
Two abstracted research articles (5% each)	10%
Review paper and presentation	30%
Contributions to class discussions	10%
	100%

Final grades will be assigned as follows:

A+ 98-100%	B+ 88-89%	C+ 78-79%	D+ 68-69%	F ≤ 59%
A 92-97%	B 82-87%	C 72-77%	D 62-67%	
A- 90-91%	B- 80-81%	C- 70-71%	D- 60-61%	

Tentative Course Schedule

Topic	Date
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Introduction to Course	1-31
General Environmental Influences on Physical Activity	1-31
General Characteristics of the Thermal Environment and Mechanisms of Thermal Regulation	2-7
Biophysics of Heat Transfer and General Clothing Considerations	2-7
Basic Mechanisms of Thermal Regulation and Acute Physiological Responses to Heat Stress During Exercise	2-14
Hypohydration, Hyperhydration, and Body Fluid Responses	2-14
Adaptations to Heat Stress	2-21
Physical Training, Cardiorespiratory Fitness, and Exercise-Heat Tolerance	2-21
Effects of Gender, Circadian Rhythms, Sleep, and Age on Thermal Responses During Exercise	2-28
Acute Cold Responses	3-6
Adaptations to the Cold and the Effects of Physical Training on Cold Tolerance	3-13
First Lecture Examination	3-20
Spring Break – No Class	3-27
Acute Effects of High Altitude	4-3
Adaptations to High Altitude and the Effects of Training at Altitude	4-10
Hyperoxia and Hyperbaria	4-17
Air Pollution	4-24
Global Warming and Other Sustainability Issues Related to Human Performance	5-1
Microgravity	5-8
Student Review Paper Presentations	5-15
Second Lecture Examination (17:15-19:30)	5-22