PEP 562: EXERCISE IN EXTREME ENVIRONMENTS

Division of Physical Performance and Development

Semester:	Spring 2006
Class Time/place:	W, 4:00 to 6:30 pm, Room B100
Instructor:	Suzanne Schneider, Ph.D.
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Graduate Assistant:	Young
Email:	sschneid@unm.edu
Office Hrs:	MWF 11:00 to 12:00, 1:00 to 2:00
	Other days/hrs available by appointment
Web Site:	www.unm.edu/~sschneid
Prerequisites:	PEP 426 (Intermediate Exercise Physiology)

Course Description:
This course is designed as a graduate-level course to provide research-based findings on how certain environmental stresses alter the physiological responses to exercise. The environmental stressors to be covered include: altitude, heat, cold, diving, microgravity, hypergravity, and pollution.

Rationale:
Career opportunities for exercise physiologists often involve situations that involve exercise under extreme environmental conditions. Sports medicine specialists must deal with athletes who train and compete under a wide variety of environmental conditions: those that vary in terms of temperature, altitude, or environmental pollutants. Some exercise physiologists may work for government or military laboratories. In these careers, the population they support may be exposed to hypergravity (pilots), microgravity (astronauts), or extreme environmental conditions (temperature, pressure, or biological agents). With recent trends in increased participation in "extreme sports", exercise physiologists may be required to understand normal individuals' response to environmental extremes involved in recreational activities (cave or saturated diving, mountain climbing).

Course Objectives:
To acquire:

1. knowledge of environmental extremes persons may experience
2. knowledge of how the human body responds to environmental extremes, both acute and chronic exposures
3. familiarization with strategies to minimize detrimental effects of environmental extremes
4. research skills common to environmental physiology investigation
5. familiarization with current interests in environmental physiology research

Instructional Format
One 2.5-hr session each week, consisting of lecture instruction, laboratories, group discussions, or demonstrations using various multimedia (CD-ROM, software, overhead, etc.) outlets. Laboratory experiences and case studies will allow students the opportunity to incorporate the theoretical information into practical application. Guest lecturers may be invited to share experiences.

Each class session will be divided two periods, separated by a 15-min break. A class may begin for example with a 60-min lecture followed by a 15-min break. The remainder of the class will then be used for class discussion of key papers on the topic. Students will alternate leading the discussion sessions. Alternately a class session may involve a 1.5 hr period for an exam, a 15-min break, then a 60-min lecture. During the 4 lab sessions, the class will begin with a discussion of the lab purpose, methods, and data reduction. Followed by the lab itself, which may take place in the Environmental Physiology Lab or the altitude chamber. Lab reports will be due two weeks after the lab.

Lab Reports (4):
Lab reports will follow a exercise science manuscript format (MSSE), but shorter. It should begin with an *introduction* section leading up to the statement of the problem and hypotheses. The *methods* section should include the experimental procedures and methods. The *results* section should present and illustrate the data in table and figure format. Appropriate statistical analysis should be performed on the data. The *discussion* section should include a comparison of results to other recent published literature and summarize the most relevant findings and potential applications of the results. The reference section should list 5-10 articles mentioned in the paper. The completed paper should be approximately 7-8 double-spaced, typed pages long including tables and figures.

Text (required):
Armstrong, LE. *Performing in extreme environments.* Human Kinetics, 2000.

Piantadosi, CA. *The Biology of Human Survival.* Oxford University Press, 2003.

Course Packet. Misc papers for sale in Education Copy Center

Other Useful Texts:
Robergs R.A. and S.O. Roberts. *Exercise Physiology: Exercise, Performance and Clinical Applications.* McGraw Hill, Inc., St. Louis, 1997.

McArdle WD, FI Katch, and VL Katch. *Exercise Physiology*, 5th Edition, 2001.

Nicogossian AE, CL Huntoon, SL Pool. *Space Physiology and Medicine.* Lea & Febiger, 1994.

Wilmore JH and DL Costill. *Physiology of Sport and Exercise.* Human Kinetics, 2nd Edition, 1999.

Grading:

97 - 100	A+	73 - < 77	C
93 - < 97	A	70 - < 73	C-
90 - < 93	A-	67 - < 70	D+
87 - < 90	B+	63 - < 67	D
83 - < 87	B	60 - < 62	D-
80 - < 83	B-	< 60	F
77 - < 80	C+		

Evaluation:

Lab Reports (4)	15 pts each

Final Exam	20 pts
Class participation	20 pts—leading paper disc and participation

Class participation, which involves taking an active role in leading and participating in discussions and laboratory activities, will be weighed in computing the final grade. Grades may be moved up or down one level based on the class participation score.

No make-ups on exams, assignments, or labs without written medical (or similar) excuse. Assignments and projects are due on the date specified.

Special Needs: Qualified students with special needs should see me as soon as possible.

Professional Courtesy: Please make sure you turn off all cellular phones and audio-activated pagers in class. Students are expected to be on time for class and stay till the end of class.

Academic Integrity: Academic dishonesty defined from the UNM Student Code of Conduct: "dishonesty in quizzes, tests or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or other professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records." The Exercise Science faculty support the importance of academic integrity. A student violating academic dishonesty guidelines will receive an "F" for the course. A second violation will result in the student being withdrawn from the Exercise Science program.

Class Participation: Class participation or involvement in other aspects of the class (lab experiences, etc.) by students is considered to be an integral part of this course and essential for learning.

Consultation: If you have questions, or need help, please see me ***promptly!*** I am available to discuss class lecture material, other aspects of the class, or to simply chat about life! Please don't wait until it is too late to get clarification or help.

PEP 562: Exercise in Extreme Environments
***Tentative* Course Schedule**

Week	Date	Topic	Readings
1	1/18	Stressful environments and adaptation	A Chapt 1 P Chapts 1-3
2	1/25	Heat and Humidity	A Chapt 2 P Chapt 7&8
3	2/1	Heat lab	
4	2/8	Hydration and Starvation	A Chapt 2 P Chapt 4-6
5	2/15	Hydration Lab	
6	2/22	Cold and cold immersion	A Chapt 3 P Chapt 9-11
7	3/1	Altitude	A Chapt 5 P Chapt 15
8	3/8	Altitude lab	
SPRING BREAK-No Classes 3/15-19			
9	3/22	Diving physiology/hyperbaria	A Chapt 4 P Chapt 13-14
10	3/29	Hypergravity/Aviation	P Chapt 16-17
11	4/5	Microgravity	P Chapt 18,20
12	4/12	Orthostatic lab	
14	4/19	Air Pollution	A Chapt. 6 P Chapt 12
15	4/26	Biologic Rhythms	A Chapt 8
16	5/3	Radiation and Biologic Hazards	A Chapt 7 P Chapt 19

Final Exam: May 10, 5:30-7:30