EXSC 320-01: Environmental Aspects of Exercise - Spring 2016

Course Meeting Times: Tues & Thurs 5:30 - 6:45p, Physical Education Center 111

Instructor: David Thomas; ddthomas@cofc.edu

Office Hours: Tues & Thurs 4:30-5:30, Physical Education Center 111

Suggested Prerequisite: EXSC 340/L

Optional Course Textbook: Performing in Extreme Environments, Lawrence E. Armstrong, PhD

Course Description: A course designed to cover and supplement a variety of topics not otherwise offered in the list of directed electives in exercise science. Topics of interest to students and faculty will be offered on a rotating random basis according to interest.

What to Expect: Because the above course description tells you absolutely nothing about this specific course please consider the following to be a more expressive and helpful description: This course covers the physiological considerations of exercise performance in the various environments that humans are exposed to during work and play. Special attention is given to the acute and chronic physiological mechanisms involved when an individual is exposed to these environments.

Course Objectives:
1. Students will review and describe the acute and chronic physiological adaptations associated with exposure to the environments covered in this course. Special attention will be given to physiological mechanisms related to multiple environments (i.e. oxyhemoglobin dissociation curve and the Bohr Effect).
2. Students will review the physical properties that characterize each environment (i.e. partial pressure of oxygen at altitude and below sea-level).
3. Students will apply this knowledge to real-world exercise performance situations in various sports including both strength and power as well as endurance events.
4. Students will develop multimedia communication skills through the class journal article review webpage and presentations to their peers.

Student Learning Outcomes:
1. Through participation in this course, students will be able to identify and describe physiological mechanisms associated with acute and chronic exposure to the environments covered in this course.
2. Students will be able to apply this knowledge to optimal competition and training strategies in sport.
3. Students will learn and demonstrate multimedia communication skills including video production and lay summary writing through publishing two entries on the class journal article review webpage (www.enviphys.wordpress.com).
4. Through participation in this course and two presentations to their peers, students will develop communication skills suitable for presenting the latest exercise science research to coaches and athletes.

Course Schedule:

Week 1:
R 1/7: Introduction, Syllabus

Week 2:
T 1/12: Physics of Altitude, Acute Altitude
R 1/14: Chronic Altitude, Altitude Illness

Week 3:
T 1/19: Altitude training
R 1/21: Altitude Test, Intro Cold

Week 4:
T 1/26: Cold, Thermoregulation
R 1/28: Cold, Performance

Week 5:
T 2/2: Cold Injuries
R 2/4: Cold Essay Test, Expedition project

Week 6:
T 2/9: Space, physiological adaptations
R 2/11: Space, countermeasures

Week 7:
T 2/16: Space, research
R 2/18: Space Essay Test, Hyperbaric Intro

Week 8:
T 2/23: Hyperbaric environments
R 2/25: Hyperbaric injuries and medical considerations

Week 9:
T 3/1: Presentations
R 3/3: Presentations

Week 10:
T 3/8: No Class/Spring Break
R 3/10: No Class/Spring Break

Week 11:
T 3/15: Heat, thermoregulation refresher
R 3/17: Heat, acclimatization
Week 12:
T 3/22: Heat, performance
R 3/24: Heat illnesses

Week 13:
T 3/29: Heat summary and review
R 3/31: Heat Essay Test

Week 14:
T 4/5: Biorhythms/ Jet Lag
R 4/7: Air pollution

Week 15:
T 4/12: Air pollution Lab (in class)
R 4/14: Presentations

Week 16:
T 4/19: Presentations

~ Final: Thursday, April 28th 7:30-10:30p ~

*Course schedule is subject to change

Course Grading:
Presentations: (2 x 5%) 10%
Journal article summary: (2 x 5%) 10%
Expedition project: 5%
Tests: (4 x 10%) 40%
Air pollution lab: 5%
Final Exam: 30%

Evaluation Scale (Implemented 2006-2007):

A  90-100%  A-  88-89%  B+  85-87%  B  80-84%  B-  78-79%  C+  75-77%  C  70-74%  C-  68-69%
D+  66-67%  D  64-65%  D-  62-63%  F  0-61%

Descriptions of Assessments:

Presentations: You are required to give two presentations five-minutes in duration. If you choose to use a slide deck, you may not include text on the slides other than titles and chart/table labeling. You are encouraged to USE GRAPHS, CHARTS, PICTURES, VIDEOS, and other multimedia.

You will formulate your own topic for your presentation. To narrow down the subject matter you will choose a sport, event, or grouping of sports (i.e. endurance, strength/power) then an
environmental factor that we cover in this course, and lastly a time frame (acute or chronic exposure).

**Journal Article Summaries:** You are asked to review/summarize two original journal articles over the course of the semester. Both articles must be relevant to Environmental Aspects of Exercise. There are three parts to these assignments;
1. Find an article and post a short written summary on our class blog - there is no word count minimum or maximum.
2. Record a short video (< 60 seconds) of you summarizing the article. You may edit as you please to get under 60 seconds. Please rest your phone or camera instead of holding by hand, or use a tripod.
3. Field relevant questions from classmates and instructor in class on due date.

**Expedition Project:** You will be asked to plan the physical conditioning and schedule of a Himalayan expedition. In this assignment you must consider the nutritional and medical needs of the climbers. Please cover the effects of altitude and cold climates. This assignment will be accepted on OAKS dropbox.

**Air Pollution Lab:** You will have a lab assignment dealing with the statistical analysis of air pollution data. This assignment will be completed during class time.

**Tests:** There will be a test following each of the four main units; Altitude, Cold, Space, and Heat. These test will consist of 2-6 questions requiring written responses. Drawing graphs and charts is encouraged.

**Final Exam:** There will be a final exam with questions similar to those found on the previous four tests. The final will also include material from the lectures on Hyperbaria, Air pollution, and Biorhythms/Jet lag.

**Academic Honor Code:**
The academic honor code forbids lying, cheating, and plagiarism. Plagiarism is defined as presenting the work of others as your own and copying sources without citation. Plagiarism or cheating on an exam will result in an XF grade for the course. Students can find the complete Honor Code and all related processes in the Student Handbook at [http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php](http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php)

**Absences:**
Students are permitted TWO absences over the course of the semester. Absences beyond two – unless they are documented by a memo from the Absence Memo Office ([http://studentaffairs.cofc.edu/about/services/absence.php](http://studentaffairs.cofc.edu/about/services/absence.php)) - will result in a loss of 2.5% points
from the final grade per extra absence. I will document absences by taking roll at the beginning of class. If a student is not present when roll is taken, he or she will be officially ‘absent’.

**Make-Up Policy:**
Make-up exams are given at the discretion of the professor and are only considered for documented and approved absences. It is the student’s responsibility to contact the instructor if a make-up is necessary. Late assignments, if accepted, will be penalized 25% per day.

**Disability Statement:**
The College will make reasonable accommodations for persons with documented disabilities. Students should apply at the Center for Disability Services / SNAP, located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying me, during my office hours or by email, as soon as possible and for contacting me before accommodation is needed.

**Changes:** The schedule and procedures described on this syllabus are subject to change.