

KNES 313/494: "Peru 2014: Life at the Top" Study Abroad
Semester: Summer 2014

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Course Locations: Towson Component (JUNE 9-19): Study Abroad Component (JUNE 20-28):
Towson University IWB Cusco, Peru
Wellness Center
One Olympic Place, Room 200
Towson, MD 21204

Course Content:

The overarching goal of the program is to provide students with first hand knowledge of the basis of altitude stress and the challenges, responses, and factors of exertion affected by high altitude. The program is divided into 2 components. The first component (June 9-19) involves classroom and laboratory based instruction at the Towson University Wellness Center Human Performance Lab. The study abroad component (June 20-28) will expand upon the theoretical perspectives and practical "laboratory-based" experiences through direct "fieldwork" experience in Peru. Throughout your stay in Peru, you will be collecting a wide array of physiologic data on yourself and your classmates and use this data to address hypotheses as they relate to human physiology and environmental stress.

Credit Hours: Exercise Physiology (KNES 313) – 3 credits
Travel Study in Kinesiology (KNES 494) – 3 credits
Prerequisites: BIOL 213 and BIOL 214

Course Objectives:

1. Develop a theoretical grounding for the principles of various physiological systems of the body and their regulation in response to acute exercise at environmental extremes.
2. Understand how to apply the scientific method to test hypotheses related to exercise performance and environmental stress.
3. Develop proficiency in several aspects of human subjects research, including: laboratory and field-based outcomes testing, data interpretation and abstract/paper writing.
4. Understand the challenges posed by environmental extremes and the physiological adaptations to chronic altitude exposure.

Texts:

Kraemer W.J., Fleck S.J., and Deschenes, M.R. (2010). *Exercise Physiology: Integrating Theory and Application*. Philadelphia, PA: Lippincott William & Wilkins

Ashcroft F. (2000). *Life at the Extremes: The Science of Survival*. Los Angeles, CA: Harper Collins Publishers, Ltd.

Online Learning:

Human Subjects Training

<http://phrp.nihtraining.com/users/login.php>

Research and HIPAA

http://privacyruleandresearch.nih.gov/clin_research.asp

Supplemental Readings:

TBD

[Note: A list of supplemental readings will be provided to students. These readings will reinforce concepts discussed in the above texts and will likely consist of peer reviewed manuscripts from the scientific literature. A list will be compiled as the course is being developed.]

Assessments:

The following assessments will be used for assigning a grade in KNES 313

Exams (3)

Description: Consistent with the first objective of this course the exams are designed to test theoretical knowledge. *The content of the exams will be based on lectures, readings, lab assignments and class discussion. The exams will test your ability to 1) describe the sources of energy production that are required by the body during rest and exercise, 2) understand the principles of physiological systems of the body, and 3) understand the nutritional and environmental challenges encountered during exercise. Exams will be a mix of true/false, multiple choice, fill-in-the-blank and short answer questions.*

Course Objectives Met: 1 & 2

Total Points: 300 points

Percentage of Final Grade: 68%

Quizzes (6)

Description: *Quizzes will cover chapters of the text and information gleaned from supplemental readings. They function to prepare you for the written exams and are designed to make sure you are keeping up with the material. Quizzes will be a mix of true/false, multiple choice and fill-in-the-blank questions. Your lowest quiz grades will not be included in your final grade.*

Course Objectives Met: 1

Total Points: 75 points

Percentage of Final Grade: 17%

Lab assignments (3)

Description: *Lab assignments are designed to give you hands-on experience with data collection, calculations and procedures. Data will be collected from each student. You will prepare small reports of the data and answer questions related to each lab. These assignments will prepare you for the practical skills assignments offered in the second week of the program (See Practical Skills). Data collected in these assignments will also be used to construct a physiological profile for each student to be used when addressing hypotheses for the final written paper.*

Course Objectives Met: 1 & 3

Total Points: 60 points

Percentage of Final Grade: 15%

The following assessments will be used to assign a grade in KNES 494

Human Subjects Training

Description: *Since most research in exercise science involves human subjects, it is important for researchers to consider the ethical principles and regulations that guide their research activities. Prior instances of scientific misconduct have led to the formulation of ethical principles and guidelines for conducting research activities with human subjects. You are required to complete the human subjects training at the websites prior to beginning the second week of this course.*

Course objectives met: 2 & 3

Total Points: 25 points

Percentage of Final Grade: 5%

Practical Skills

Description: The ability to collect accurate and reliable data is an essential element to the research process. Students will develop basic laboratory skills that will be used during the study abroad component to address hypotheses related to human performance and altitude stress. Specifically, you will be required to demonstrate competencies in the following: pulmonary testing, blood pressure and heart rate assessment, submaximal exercise tolerance testing, sleep data interpretation and physical activity and dietary recall.

Course objectives met: 2 & 3

Total Points: 100 points

Percentage of Final Grade: 20%

Diary Entries

Description: Each day, you will be asked to complete a diary entry. This entry should be a synthesis of reading material, daily lecture, and experiences of the day. In addition, diary entries should include a comprehensive listing of all physiological, behavioral and environmental data for that day. Environmental data may include temperature, humidity, barometric pressure. Physiological data will include pulmonary function, cardiovascular function, fatigue, energy expenditure and exercise capacity. Behavioral data will include a daily sleep diary, dietary and physical activity recall. Parts or all of these data will be used in the final written paper. Assessment of the diaries will be based on completeness, clarity and organization.

Course objectives met: 2-4

Total Points: 125 points

Percentage of Final Grade: 25%

Final Written Paper

*Description: You will complete a final written paper in standard IMRAD format: **Introduction:** Includes definitive statement that specifies the question or issue to be investigated in the research study; study significance; scope of the study; limitations; specific aims and hypotheses. **Methods:** Provides a comprehensive data collection plan that provides procedures for acquiring the information needed to attack the problem. In this section the researcher illuminates where the data came from (sources), how the data were gathered (collection methods), and how the data were analyzed (treatment). **Results:** A comprehensive reporting of the data in a clear, concise and well-organized manner, appropriate use of text, figures and tables should be provided. **And Discussion:** Provides a clear statement of the major findings of the study, Explanation of the findings are provided and supported by previous observations in the literature.*

Course objectives met: 2-4

Total Points: 250 points

Percentage of Final Grade: 50%

Tentative Course Schedule

Monday, June 9	AM: Orientation, Lecture and group work “ <i>Bioenergetics and Meeting Metabolic Demand for Energy</i> ” PM: Quiz 1 , Lecture and group work “ <i>Nutritional support for Energy</i> ”
Tuesday, June 10	AM: Lab 1, Quiz 2 , Lecture and group work “ <i>Skeletal Muscle System</i> ” PM: Orientation to lab skills
Wednesday, June 11	AM: Exam 1 PM: Lecture and group work “ <i>Nervous System</i> ”
Thursday, June 12	AM: Quiz 3 , Lecture and group work “ <i>Cardiovascular system</i> ”

	PM: Orientation to body composition assessment
Friday, June 13	AM: Lab 2 , Orientation to exercise testing PM: Quiz 4 , Body composition assessment
Saturday, June 14	AM: Exam 2 , Body composition assessment cont'd PM: Exercise testing in the lab, Lecture and group work " <i>Pulmonary System</i> "
Sunday, June 15	Off
Monday, June 16	AM: Lab 3, Quiz 5 Lecture and group work " <i>Endocrinology</i> " PM: Practical skills Development, Group work, Exercise testing in the lab
Tuesday, June 17	AM: Quiz 6 , Group work-The research method, Exercise testing in the lab PM: Practical skills Development, Exercise testing in the lab
Wednesday, June 18	AM: Exam 3 , Group work-formulating hypotheses, Exercise testing in the lab PM: Exercise testing in the lab, practical skills development, Lecture- How to analyze physiological data.
Thursday, June 19	AM: Seminar- Physical activity, altitude and sleep PM: Exercise testing in the lab
Friday, June 20	AM: Depart from BWI PM: Arrive late evening in Lima
Saturday, June 21	AM: Breakfast, Orientation to Peru, Lecture, Prep for data collection PM: Free
Sunday, June 22	AM: Lima attractions tour PM: cont'd
Monday, June 23	AM: Flight from Lima to Cusco PM: Cusco city tour Evening: Dinner and Seminar- Environmental challenges to exercise
Tuesday, June 24	AM: Tour Valle Sagrado de los Incas PM: cont'd Evening: Dinner and Seminar- "The Incas and Altitude", Data sharing with group
Wednesday, June 25	AM: Hike the Inca trail PM: cont'd Evening: Dinner, Seminar- "Dangers of acute altitude exposure" and Data sharing with group (LODGE in Aguas Calientas)
Thursday, June 26	AM: Tour Machu Pichu (Data collection) PM: Train from Machu Pichu to Poroy Evening: Dinner, Data sharing with group
Friday, June 27	AM: Debriefing, assemble data, analyze and interpret data PM: Free afternoon in Cusco Evening: Dinner
Saturday, June 28	AM: Flight from Cusco to Lima PM: Flight from Lima to BWI

*Final Papers are due July 7th via Blackboard. The instructor will be available to address any questions related to the final papers.