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**SYLLABUS: HDPE 322 - Exercise Physiology  
Fall Semester 2007**

**INSTRUCTOR:** Dan Heil, Ph.D.  
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**OFFICE:** Romney 103  
**OFFICE HRS:** W 2-4, H 9-10:50 AM  
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**PREREQUISITES:** Students must have *taken and passed* BIOL 207 (Anatomy & Physiology Lab), HDPE 221 (Health Anatomy and Physiology), or by the instructor's permission.

- Students who *want to sign-up* for this course but have NOT taken and passed ('D' grade or higher) BIOL 207 or HDPE 221 must have the instructor's permission.
- Students who are *already signed up* for HDPE 322 but have NOT taken and passed ('D' grade or higher) BIOL 207 or HDPE 221 may be dropped by the instructor (these students will be notified no later than the first class lecture).

**MEETING TIMES:**

Lecture:	MWF in Gains 33	10:00-10:50 AM
Lab Sect. #2:	Tuesday in MSL	10:00-11:50 AM
Lab Sect. #3:	Tuesday in MSL	2:10-4:00 PM
Lab Sect. #4:	Monday in MSL	3:10-5:00 PM

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**COURSE OBJECTIVES:**

This course is designed to be an introduction to the physiological responses associated with training and participating in strength and endurance activities. In addition, students will develop an understanding of the mechanisms underlying the adaptations associated with chronic overloading. Emphasis is placed on explaining common observations and practices from the physiological point of view. The course objectives will be accomplished through a combination of lecture and lab exercises throughout the semester. The text for this course is used as a guide for the lecture, while the material for lecture is derived from many sources including the text, research articles, and the professor's own experience and research within the field of exercise physiology.

**REQUIRED MATERIALS:**

**TEXT:** *Physiology of Sport and Exercise* (3<sup>rd</sup> Edition) by Jack H. Wilmore and David L. Costill (2004). Human Kinetics: Champaign, IL.

**LAB MANUAL:** *Undergraduate Exercise Physiology Lab Manual* by D.P. Heil (2006).

**CALCULATOR:** A basic calculator with trigonometric functions will be useful for the numerous calculations required by some homework assignments, laboratory assignments, quizzes and exams.

**GRAPHS:** Students MUST be able to create scatterplot graphs from data using a computer software package of their choice. Microsoft Excel seems to be popular with most students and it is available on most all computers on campus. Hand generated graphs, even if they are extremely neat and easy to read, will NOT receive credit for laboratory assignments.

## **ATTENDANCE POLICY:**

Attendance to both lectures and labs are required as stated in the University Bulletin. Attendance but will not be taken during lecture due to the size of the class. However, attendance will be taken during your lab sections and thus can influence your grade (as described below).

- If you miss a lecture or lab it is *your responsibility* to get notes from another student in class. It is NOT the instructor's responsibility to provide lecture notes or copies of overheads to students who have missed lecture. A student who knows of necessary lab absences should consult with the instructor **PRIOR TO THE ABSENCE**.
- An absence will be excused and lab assignments may be made up IF you call IN ADVANCE (i.e., before class starts) and tell the instructor (personally or via message) that you will be missing class. NOTE: Messages relayed by friends are considered acceptable ONLY under the most extreme of circumstances (for example, you are physically unable to pick up a phone and call to leave a message because you are in the Emergency Room).
- Unless otherwise arranged, *late assignments due to excused absences* are due at **the very next class meeting**. Assignments received later will not receive credit. Students must be present in class or their assigned lab section to turn in a due assignment - *Nobody can turn your assignment in for you as the result of an unexcused absence*.
- **The highest letter grade a student can achieve will drop one letter grade for each unexcused LAB ABSENCE (ie. 1 absence and an 'A' drops to a 'B', 2 absences and an 'A' drops to a 'C',...).** **After four unexcused absences, the student will automatically fail the course regardless of their academic standing in lecture or lab.**

## **ASSIGNMENTS:**

Students will be given reading assignments from the required text AND the laboratory manual on a weekly basis. Other reading assignments that are based upon class handouts or information placed on reserve at the library may also be given. It is the student's responsibility to keep up with these assignments. If it becomes apparent that a majority of students are not reading the assignments, the instructor reserves the right to give unscheduled quizzes in lecture or lab. In addition, following each laboratory exercise, students will may be required to answer questions, create graphs and tables, or perform some other computations. These assignments will have due dates that vary throughout the semester. *While the due dates will be announced repeatedly in lecture and lab, it is the student's responsibility to make certain assignments are turned in on time.*

**\*\*ASSIGNMENTS WILL NOT BE ACCEPTED LATE\*\***  
**\*\*NO EXCEPTIONS\*\***

**Unexcused makeup tests will NOT be given, so plan ahead!!!** In the case of sickness, a doctor's note is necessary to make up a test and/or excuse an extended absence lab or lecture.



## **GENERAL STUDENT EXPECTATIONS:**

Every student enrolled in this course is expected to treat the instructors and fellow students with respect. Students are also expected to be prepared for each lecture and lab, as well as inform the instructor and/or lab TA in the event that an absence cannot be avoided. In the case of an absence (excused or unexcused) it is always the student's responsibility to get notes from fellow classmates - Not the instructor or the lab TA's.

Student Behavior. MSU expects all students to conduct themselves as honest, responsible and law-abiding members of the academic community and to respect the rights of other students, members of the faculty and staff and the public to use, enjoy and participate in the University programs and facilities. For additional information reference:

*[www2.montana.edu/student\\_conduct/cg600.html](http://www2.montana.edu/student_conduct/cg600.html)*

Collaboration Between Students. University policy states that, unless otherwise specified, students may not collaborate on graded material. Any exceptions to this policy will be stated explicitly for individual assignments. If you have any questions about the limits of collaboration, you are expected to ask for clarification.

Plagiarism. Paraphrasing or quoting another's work without citing the source is a form of academic misconduct. Even inadvertent or unintentional misuse or appropriation of another's work (such as relying heavily on source material that is not expressly acknowledged) is considered plagiarism. If you have any questions about using and citing sources, you are expected to ask for clarification.

E-mail Policy. Students are expected to check their university email at least once per week. The instructor will occasionally send messages regarding updates to lab meetings, reading assignments, change in exam dates, etc.

Students With Disabilities. If you have a documented disability for which you are or may be requesting an accommodation(s), you are encouraged to contact your instructor and Disabled Student Services as soon as possible.

Portable Electronic Media and Communication Devices. These are not to be used during lecture or lab for any reason without prior approval from the instructor. Examples of such devices include cell phones, pagers, MP3 players, and iPods. If you are uncertain about the use of a device not listed, please ask the instructor before attempting to use the device in class.

## Outline for Reading Assignments

The reading assignments provided below are given in the general order in which they will be covered. Any changes or clarifications to these assignments will be given during lecture. In addition, other articles than those listed below may be placed on electronic reserve (ER). Students will be notified of these additions during lecture.

Topic	Chapter: Title	Pages
Introduction	Intro: An Introduction to Exercise and Sport Physiology	1-13
Metabolism	C4: Metabolism, Energy, & the Basic Energy Systems	119-154
	✓ ER: Gastin, P.B. <i>Energy System Interaction and Relative Contribution During Maximal Exercise.</i>	
	✓ ER: Rankin, J.W. <i>Dietary Carbohydrate and performance of brief, intense exercise.</i>	
	✓ ER: Utter, A.C. et al. <i>Carbohydrate supplementation and perceived exertion during prolonged running.</i>	
	✓ ER: Hagerman, F.C. <i>Energy metabolism and fuel utilization.</i>	
	✓ Chapter 13: Nutrition and Sport	407-412
	✓ ER: Sherman, W.M. <i>Muscle glycogen supercompensation during the week before athletic competition.</i>	
EPOC	✓ ER: Quinn, T.J. et al. <i>Postexercise oxygen consumption in trained females: Effect of exercise duration.</i>	
VT & LT	C8: Respiratory Regulation During Exercise	259-264
Aging	C17: Aging in Sport and Exercise	540-554
Gender	C18: Sex Differences in Sport and Exercise	573-582
Modeling	C9: Cardiovascular and Respiratory Adaptations to Training	300
	✓ ER: Pate, R.R., Branch, J.D. <i>Training for endurance sport.</i>	

### < < Exam #1 - Wednesday, October 3<sup>rd</sup> > >

Introduction	An Introduction to Exercise and Sport Physiology	20-21
Metabolic	C6: Metabolic Adaptations to Training	184-196
VO <sub>2</sub> MAX	C9: Cardiovascular and Respiratory Adaptations to Training	293-297

Review	C1: Muscles and How They Move	34-55
Review	C2: Neurological Control of Movement	60-61
General	C3: Neuromuscular Adaptations to Resistance Training	86-104
	✓ ER: Johnson, R.E. et al. <i>Strength training in female distance runners: Impact on Running Economy.</i>	
	✓ ER: Runge, M. Et al. <i>Is muscle power output a key factor in the age-related decline in physical performance?</i>	
Strength	C6: Metabolic Adaptations to Training	196-201
Aging	C17: Aging in Sport and Exercise	540-556
Gender	C18: Sex Differences in Sport and Exercise	573-582

**< < Exam #2 - Wednesday, October 31<sup>st</sup> > >**

General	C7: Cardiovascular Control During Exercise	208-239
Aging	C17: Aging in Sport and Exercise	540-554
	✓ ER: Hawkins et al. <i>A longitudinal assessment of change in <math>\dot{V}O_{2MAX}</math> and maximal heart rate in master athletes.</i>	
	✓ ER: Zavorsky, G.S. <i>Evidence and possible mechanisms of altered maximum heart rate with endurance training and tapering.</i>	
	✓ ER: Zhou, B. Et al. <i>Stroke volume does not plateau during graded exercise in elite male distance runners.</i>	
Gender	C18: Sex Differences in Sport and Exercise	573-582
	C10: Exercise in Hot and Cold Environments: Thermoregulation	315-326
General	C8: Respiratory Regulation During Exercise	247-256
	C15: Nutrition and Sport	425-431
	C11: Hypobaric Environments: Exercise at Altitude	338-351

**< < Exam #3 - Wednesday, Dec. 5<sup>th</sup> > >**

**< < < Final Exam - Monday, December 10<sup>th</sup>, 8-9:50 AM, Gaines #33 > > >**

## HDPE 322 Semester Schedule

Dates	Events
<b>8/27 - 8/31 (Week #1)</b>	<ul style="list-style-type: none"> <li>• Meet for Lab #1 - Tests of Anaerobic Power. <i>Students MUST dress down in order to participate in lab.</i></li> </ul>
<b>9/3 - 9/7 (Week #2)</b>	<ul style="list-style-type: none"> <li>• NO LAB MEETINGS THIS WEEK.</li> <li>• NO LECTURE on Monday - Labor Day Holiday.</li> <li>• <b>Lab #1 due Wed., 9/5, at the beginning of lecture.</b></li> </ul>
<b>9/10 - 9/14 (Week #3)</b>	<ul style="list-style-type: none"> <li>• Will start Lab #2 (TDEE). <i>Students do NOT need to dress down.</i></li> <li>• Lab #1 will be returned this week.</li> </ul>
<b>9/17 - 9/21 (Week #4)</b>	<ul style="list-style-type: none"> <li>• <i>TDEE calculations for Lab #2 are due at the beginning of lab class.</i></li> <li>• Will cover Lab #3 (EPOC). <i>All students MUST dress down in to participate.</i></li> </ul>
<b>9/24 - 9/28 (Week #5)</b>	<ul style="list-style-type: none"> <li>• <b>Lab #2 due at beginning of your scheduled lab class.</b></li> <li>• Will go over Lab #4 (Prediction of <math>VO_{2MAX}</math>) - All students must dress down.</li> </ul>
<b>10/1 - 10/5 (Week #6)</b>	<ul style="list-style-type: none"> <li>• <b>EXAM #1</b> - Given on Wednesday in lecture.</li> <li>• <b>Lab #3 due at beginning of your scheduled lab class.</b></li> <li>• Will go over Lab #5 (Measurement of <math>VO_{2MAX}</math>). <i>Only those students who volunteer to be tested need to dress down.</i></li> </ul>
<b>10/8 - 10/12 (Week #7)</b>	<ul style="list-style-type: none"> <li>• <b>Lab #4 due on Wednesday at the beginning of lecture.</b></li> <li>• NO LAB MEETING THIS WEEK.</li> </ul>
<b>10/15 - 10/19 (Week #8)</b>	<ul style="list-style-type: none"> <li>• <b>Lab #5 due at beginning of your scheduled lab class.</b></li> <li>• Will cover Lab #6 (FVC Testing). <i>Students do NOT need to dress down.</i></li> </ul>
<b>10/22 - 10/26 (Week #9)</b>	<ul style="list-style-type: none"> <li>• NO LAB MEETING THIS WEEK.</li> </ul>
<b>10/29 - 11/2 (Week #10)</b>	<ul style="list-style-type: none"> <li>• <b>EXAM #2</b> - Given on Wednesday in lecture.</li> <li>• NO LAB MEETINGS THIS WEEK.</li> </ul>
<b>11/5 - 11/9 (Week #11)</b>	<ul style="list-style-type: none"> <li>• <b>Lab #6 due at beginning of your scheduled lab class.</b></li> <li>• Will cover Lab #7 (Pressor Response). <i>All students must dress down in order to participate.</i></li> </ul>
<b>11/12 - 11/16 (Week #12)</b>	<ul style="list-style-type: none"> <li>• <b>Lab #6 due on Wednesday at the beginning of lecture.</b></li> <li>• NO LECTURE on Monday - Veteran's Day.</li> <li>• NO LAB MEETINGS THIS WEEK</li> </ul>
<b>11/19 - 11/23 (Week #13)</b>	<ul style="list-style-type: none"> <li>• NO LECTURE on Friday - Thanksgiving Break.</li> <li>• NO LAB MEETINGS THIS WEEK</li> </ul>
<b>11/26 - 11/30 (Week #14)</b>	<ul style="list-style-type: none"> <li>• NO LAB MEETINGS THIS WEEK!</li> </ul>
<b>12/3 - 12/7 (Week #15)</b>	<ul style="list-style-type: none"> <li>• <b>EXAM #3</b> - Given on Wednesday in lecture.</li> <li>• NO LAB MEETINGS THIS WEEK.</li> </ul>
<b>12/10 - 12/14 (Finals Week)</b>	<ul style="list-style-type: none"> <li>• <i>Final Exam given on Monday, 12/10, 8-9:50 AM, in Gaines #33.</i></li> </ul>