

Course Syllabus
APSM 3411 - Exercise Physiology
Spring 2012
Lecture: Mon & Wed 9:30-10:50 am
Laboratory: Wed 4:00-7:00 pm

Professor:

Dr. Scott Davis
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Additional Expertise:

Ms. Kelyn Rola
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General Course Information:

1. Prerequisites: APSM 2441 – Human Anatomy & Physiology
2. Credit: Four semester hours
3. Location: Lecture: Simmons Hall, Room 208
Lab: Simmons Hall, Applied Physiology Lab, Room 118

Course Content:

This course is focused on developing an understanding of the physiological mechanisms underlying human movement. Specific topics of study include muscle physiology, respiration, cardiac function, circulation, energy metabolism, and application to training. Students are expected to have a basic understanding of algebra, general chemistry, and anatomy/physiology prior to enrollment.

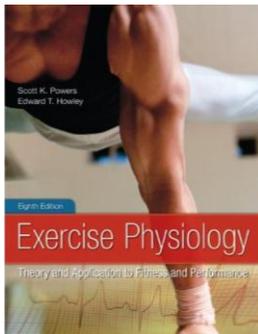
Course Objectives:

- Identify and differentiate basic structures of skeletal muscle and the mechanisms of muscle contraction.
- Characterized neurological control and reflex activity that govern muscle force production.
- Compare and contrast physiological adaptations associated with strength training, including the roles of hypertrophy, metabolism, and neurological changes.
- Describe the characteristics of muscle fiber types and their role in exercise performance.

- Explain metabolic processes responsible for the generation of ATP and the role of aerobic and anaerobic energy systems in the performance of various activities.
- Identify the basic anatomy of the cardiovascular and respiratory systems, and cardiorespiratory responses to static and dynamic exercise in terms of heart rate, blood pressure, and oxygen consumption.
- Describe the basic properties of cardiac conduction and contraction and the response of the following variables to static and dynamic exercise: heart rate, stroke volume, cardiac output, pulmonary ventilation, tidal volume, respiratory rate, and arteriovenous oxygen difference.
- Describe the physiological adaptations that occur at rest and during submaximal and maximal exercise following chronic aerobic and anaerobic training.
- Examine methods of monitoring conditioning and training intensity, including maximal and submaximal oxygen consumption, heart rate, lactate and ventilatory thresholds.
- Recognize differences in cardiorespiratory responses to acute graded exercise between conditioned and unconditioned individuals.
- Discuss the principles of specificity, overload, and detraining.
- Describe the effect of age and maturation on musculoskeletal and cardiovascular performance.
- Examine the effect of environmental conditions on exercise performance.
- Understand the role of body composition in physical performance.

Required Material:

Text:



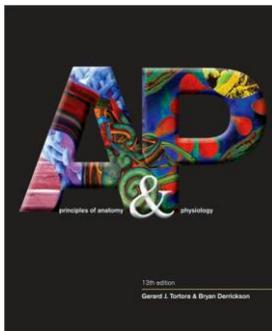
Exercise Physiology: Theory and Application to Fitness and Performance, 8th edition, 2011.

Authors: Scott K. Powers & Edward T. Howley

Publisher: McGraw-Hill

ISBN-10: 0078022533

Additional Reference:



Principles of Anatomy and Physiology, 13th edition, 2011.

Authors: Gerard J. Tortora, & Bryan H. Derrickson

Publisher: Wiley

ISBN-10: 0470565101

i>clicker:

i>clicker is an audience response system allows students to instantly provide feedback and answer questions posed by the professor. Each student uses the i>clicker software on there smart phone to answer in class questions by "clicking" on the appropriate button for his/her choice. The instructor uses a receiver that collects and records responses sent by students' i>clickers. More information on i>clickers will be made available.

Grading:

Lecture (500 points):

1. *Exams (450 points):* There will be three semester exams and a final comprehensive exam. These will be held during the regular lecture (or final examination) period and will cover only the material presented since the previous exam. The final examination will be cumulative and will draw from the materials presented throughout the semester. The format of the exams will include multiple choice, short answer, essay, and problem solving.
 - Exam #1: 100 points
 - Exam #2: 100 points
 - Exam #3: 100 points
 - Final Exam: 150 points
2. *Classroom Activities (50 points):* The class will be asked questions during each lecture to answer using i>clickers. For each question, ½ credit will be awarded for participation and ½ credit will be awarded for accurate responses.

Laboratory (325 points):

1. *Laboratory Write-ups (299 points):* There will be 13 laboratory write-ups. Laboratory write-ups are due at the beginning of class, one week following the completion of the laboratory activity, unless specified otherwise.
2. *Laboratory Quizzes (26 points):* There will be 13 laboratory quizzes (2 points each) prior to the start of each laboratory session. Quizzes will cover exercises to be performed in the laboratory. As such, students are expected to have read all scheduled laboratory manual exercises in advance prior to the laboratory period.

Grade Scale:

94-100 (771-825 points) = A
90-93% (738-770 points) = A-
87-89% (714-737 points) = B+
84-86% (689-713 points) = B
80-83% (656-688 points) = B-
77-79% (631-655 points) = C+

74-76% (606-630 points) = C
70-73% (573-605 points) = C-
67-69% (549-572 points) = D+
64-66% (524-548 points) = D
60-63% (491-523 points) = D-
< 60% (< 522 points) = F

Your grade will be determined numerically as indicated above and is 100% dependent on your performance. You have all of the information necessary to determine your grade at any time. Accordingly, there is no reason to ask the instructor for your grade. Grades will not be emailed.

Attendance Policy:

It is the responsibility of each student to attend each lecture and laboratory session for this course and to obtain and understand the material presented. In the event of an absence due to a University sponsored activity or an officially authorized absence, students remain fully responsible for the material. The lectures will be coordinated with the assigned readings and laboratory exercises. The text readings will provide students with a supplementary approach and perspective to the material. However, lectures will include information that is not covered within the text.

Laboratory sessions are mandatory and will be held in Simmons Hall, Room 118. If you know in advance about a conflict with the laboratory session, contact the professor to make other arrangements. If a student misses a lab on a particular day for reasons beyond your control, contact the instructor as soon as possible to make other arrangements. Students cannot make up missed lab time in any other conditions or manner.

Course Policies:

Professionalism:

Students are expected to arrive on time on lecture and laboratory days. Students are expected to be respectful and attentive during lectures offered by the instructor, visiting scientists, guest lecturers, or whoever may be leading a session. At all times, students are expected to act in a manner that does not interfere with the ability of the instructor to teach or fellow students to learn. Students are expected to be respectful and courteous to the instructor and fellow students.

Cell phones, PDAs, and other communication devices are to remain silenced and stowed throughout the lecture and laboratory sessions. Texting and/or emailing in class are not permitted. The use of laptops during class will not be allowed during class. During course meeting times, students should not be texting, studying material unrelated to Human Anatomy and Physiology, reading the newspaper, etc.

Students are responsible for checking SMU e-mail on a daily basis for messages from the university or from instructors.

Due Dates:

All assignments must be turned in at the beginning of class on the date listed in the syllabus. The score of a late assignment will be reduced by 10% per business day. Absence from class does not constitute notification of a late assignment. If an absence is unavoidable, the student is responsible for providing the assignment to the instructor on time. Computer/printer failures are not acceptable reasons for late assignments.

Quality of Work:

All written work must be printed legibly or typed. All logic and problem-solving steps must be shown for full credit.

Services & Accommodations:

Disability Accommodations: Students needing academic accommodations for a disability must first be registered with Disability Accommodations & Success Strategies (DASS) to verify the disability and to establish eligibility for accommodations. Students may call 214-768-1470 or visit <http://www.smu.edu/alec/dass> to begin the process. Once registered, students should then schedule an appointment with the professor to make appropriate arrangements.

Religious Observance: Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (See University Policy No. 1.9.)

Excused Absences for University Extracurricular Activities: Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (University Undergraduate Cataloge).

Approximate Lecture Schedule

Week	Dates	Topic	Readings
1	1/18	Introduction	Chap. 0
2	1/23 – 1/25	Meas. of Work, Power, & Energy Expenditure	Chap. 1
3	1/30 – 2/1	Internal Environment, Bioenergetics	Chaps. 2, 3
4	2/6 – 2/8	Exercise Metabolism	Chap. 4
5	2/13	Exam #1	
	2/15	Cell Signaling & Hormonal Responses	Chap. 5
6	2/20 – 2/22	Exercise and the Immune System	Chap. 6
7	2/27 – 2/29	Nervous System: Structure & Control of Movement	Chap. 7
8	3/5	Skeletal Muscle: Structure & Function	Chap. 8
	3/7	Exam #2	
9	3/12 – 3/14	<i>No Class – Spring Break</i>	
10	3/19 – 3/21	Circulatory Responses to Exercise	Chap. 9
11	3/26 – 3/28	Respiration During Exercise	Chap. 10
12	4/2 – 4/4	Acid Base Balance	Chap. 11
13	4/9	Temperature Regulation	Chap. 12
	4/11	Exam #3	
14	4/16 – 4/18	Physiology of Training	Chap. 13
15	4/23 – 4/25	Factors Affecting Performance	Chap. 19
16	4/30	Training for Performance	Chap. 21
	5/2 – 5/8	Final Exam (date & time TBD)	

Approximate Laboratory Schedule

Week	Dates	Topic	Readings
1	1/18	<i>No Laboratory</i>	
2	1/25	Data Acquisition & Data Management	Lab 1
3	2/1	Submaximal Aerobic Metabolism	Lab 2
4	2/8	Maximal Aerobic Metabolism	Lab 3
5	2/15	Lactate Metabolism	Lab 4
6	2/22	Anaerobic Power	Lab 5
7	2/29	Muscular Strength	Lab 6
8	3/7	EMG	Lab 7
9	3/14	<i>No Laboratory – Spring Break</i>	
10	3/21	Muscular Fatigue and Efficiency	Lab 8
11	3/28	ECG and Blood Pressure	Lab 9
12	4/4	Cardiovascular Function	Lab 10
13	4/11	Pulmonary Function	Lab 11
14	4/18	Thermoregulatory Function	Lab 12
15	4/25	Cardiovascular Drift	Lab 13