



## Request for Undergraduate Course Addition - Page 2

### Additional Information Required for Undergraduate Course Addition

College: COEHS

Department/Division: ESSR

Alpha Designator/Number: ESS 346

Provide complete information regarding the new course addition for each topic listed below. Before routing this form, a complete syllabus also must be attached addressing the items listed on the first page of this form.

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1. Identify by name the faculty in your department/division who may teach this course.

Eric Arnold, Ph.D.  
Gina Evans, Ph.D.  
Graduate Teaching Assistants

2. If your department/division requires additional faculty, equipment, or specialized materials, attach an estimation of money and time required to secure these items.

N/A

3. If this course will be required by a department/division other than your own, identify by name.

Department of Dietetics  
Community College/Physical Therapy Assistant Program


4. If there are any agreements required to provide clinical experience, attach details and signed agreements.

N/A

5. If library resources are deemed inadequate, attach a plan to overcome this. The plan must include the cost as stated by the Dean of Libraries.

N/A

6. EQUIPMENT/SUPPLIES NEEDED TO TEACH THIS COURSE (this does not refer to additional equipment/supplies that need to be purchased; simply what materials are needed in order to teach this course successfully.):

YSI Lactate Analyzer Chemicals – Starter Kit 2323	Thermistors	Hydrostatic Weighing Tank (Underwater Weighing)	Polar HR Monitors
Cycle Ergometer	Sit/Reach Box	Skinfold Calipers	Stop Watches
Treadmill	Gym Mats	Gulick Tape Measures	BP Cuffs/Stethoscope
Sensor Medics Metabolic Cart	Step test	Stadiometer	EKG Machine/Supplies 
Isokinetic (Cybex)		Scale	

7. ADDITIONAL GRADUATE REQUIREMENTS IF LISTED AS AN UNDERGRADUATE OR GRADUATE COURSE (please also submit to Graduate Council course addition for 5xx graduate component):

N/A

8. PROVIDE A COMPLETE BIBLIOGRAPHY INCLUDING ALL PUBLICATIONS RESEARCHED TO CREATE THIS COURSE AND WHAT PUBLICATIONS MAY BE BENEFICIAL TO STUDENTS TAKING THIS COURSE (separate page).

# COURSE SYLLABUS

## ESS 346 (2hrs) EXERCISE PHYSIOLOGY LABORATORY

Fall 2009

**WHEN:** TBA

**LOCATION:** Exercise Physiology Laboratory

**TIME:** TBA

**INSTRUCTORS:** Eric Arnold, Ph.D.; Gina Evans, Ph.D., and Graduate Teaching Assistants

**OFFICE:** GH 108/GH 1E/Exercise Physiology Laboratory

**PHONE:** 304-696-2412/2924

**EMAIL:** arnoldc@marshall.edu and evansg@marshall.edu

**OFFICE HOURS:** TBA

**PREREQUISITE:** ESS 201 (Scientific Foundations of Physical Education)  
or BSC 227 (Human Anatomy)  
BSC 228 (Human Physiology) **strongly** recommended  
Chem 203 or 211/217 **strongly** recommended

**COURSE DESCRIPTION:** Laboratory course that demonstrates and reinforces concepts pertaining to the effects of exercise on physiological systems.

**REQUIREMENT:** The Exercise Physiology Laboratory course must be taken in conjunction with ESS 345 Exercise Physiology lecture course.

**REQUIRED TEXTBOOK:** *Exercise Physiology Laboratory Manual*, 5<sup>th</sup> Edition, Gene M. Adams and William C. Beam. New York: McGraw Hill, 2008.  
Supplemental Laboratory Materials

**PURPOSE OF THE COURSE:** The purpose of the laboratory course is to reinforce physiological concepts introduced in ESS 345 Exercise Physiology.

## **EXPECTATIONS and ATTENDANCE**

Class attendance is extremely important and you are expected to attend **all** classes. Qualified **excused** absences will be considered to be **an illness, family crisis** or **approved institutional activity**. This **does not** include routine medical appointments (unless of special nature and only with written notification and approval). Classes that are missed to count for an excused absence must be verified, in writing, with the instructor ahead of time in regard to an institutional activity. **Absences** will be counted as unexcused unless the student provides written documentation and verification within **one week** of the class missed. **A STUDENT HAVING EXCESSIVE UNEXCUSED ABSENCES WILL BE ADVISED TO DROP THE COURSE.** Students are required to make-up missed labs within **one week** of returning to class at a time mutually agreed upon with the instructor except with scheduled institutional activities which will be discussed **AHEAD** of time for a make-up schedule.

## **POLICY ON ACADEMIC HONESTY**

The University assumes as a basic and minimum standard conduct in academic matters that students are honest and they submit for credit only the products of their own efforts. All dishonest work will be rejected as the basis for academic credit. This includes work done in unauthorized collaboration with another person, falsification, or plagiarism (for instance, misrepresented material, fabricated information, false or misleading citation sources, falsification of the results of experiments or computer data). Any of the above violations will result in a final grade of **F** being received.

## **OTHER PERTINENT INFORMATION**

The laboratory begins at **TBA**; therefore, it is important to be on time. If you are going to be late, **call** and **inform** the instructor. If you have to leave class early, inform the instructor (by phone or email) prior to class and try and sit close to the exit to minimize disruption to your fellow classmates. Also, please keep **paggers, cell phones, beepers, personal digital assistants, satellite messaging systems or other audible communicators** turned off during lecture or on vibration mode. Show **respect** toward your classmates. However, questions are welcomed during lecture.

Participation in this laboratory class involves administering and performing various physical tests. All students should be dressed appropriately in exercise clothing (shorts, t-shirt [sports bra underneath for females] and athletic shoes) during each class period unless otherwise informed. **Lab instructors reserve the right to ask you to leave lab if you are dressed inappropriately.** If this happens, you will be counted absent.

## GRADING POLICY

Each lab and test is given specific points. At the end of the semester, the total points you have received will determine your grade based upon the following:

### GRADING

<b>Comprehensive Written Exam</b>	<b>100 points</b>
<b>Comprehensive Practical Exam</b>	<b>100 points</b>
<b>Labs (12 @ 30 points each)</b>	<b>360 points</b>
<b>Total Points</b>	<b>560 points</b>

<b>GRADE</b>	<b>PERCENTAGE</b>	<b>POINTS</b>
<b>A</b>	<b>89.5-100</b>	<b>501-560</b>
<b>B</b>	<b>79.5-89</b>	<b>445-500</b>
<b>C</b>	<b>69.5-79</b>	<b>389-444</b>
<b>D</b>	<b>59.5-69</b>	<b>333-388</b>
<b>F</b>	<b>&lt; 59.5</b>	<b>0-332</b>

### TESTS

Two tests will be given during the semester. The **comprehensive practical exam** will consist of **5 scenarios** that the student will complete with a partner. The 5 scenarios will mirror the laboratory exercises performed in class. The **comprehensive written exam** will have **100** questions which will reflect material covered in the 12 laboratory assignments.

### LABORATORY ASSIGNMENTS

You are responsible for 12 laboratory write-ups as indicated on the enclosed schedule. The lab reports allow you to demonstrate that you can clearly and concisely document the procedures and findings from the laboratory session. The reports will also give you practice at mastering the scientific writing format. Each report must be typed, double-spaced, using one inch margins, 12 point, Times New Roman font, spell-checked, and include the following sections:

- A. Title
- B. Introduction and Purpose
- C. Methods
- D. Results
- E. Discussion and Conclusions

- Lab reports will be graded on accuracy, clarity, and conciseness. Proper grammar and spelling will factor into the grade, as will your ability to correctly answer the discussion questions.
- **Your lab report is due at the beginning of class on the date of your regularly scheduled lab** (Example, if your regular lab is Monday from 8-9:50 a.m., your lab write-up is due 8 a.m. the following Monday). **No late assignments will be accepted. If you are tardy for lab, your lab write-up will be considered late, it will not be accepted, and you will receive a zero for that assignment.**

**COURSE OBJECTIVES:** Upon completion of the laboratory course the student should be able to:

1. Calibrate and utilize the Sensor Medics Metabolic Cart to quantify maximal oxygen consumption.
2. Measure and interpret ventilatory responses to exercise utilizing the Sensor Medics Metabolic cart.
3. Quantify pulmonary lung volumes utilizing the Sensor Medics Metabolic cart.
4. Quantify blood lactate responses to exercise utilizing the YSI Blood Lactate and Glucose Chemistry Analyzer.
5. Utilize the isokinetic device to quantify skeletal muscle characteristics and muscular fatigue.
6. Quantify body composition utilizing various techniques.
7. Palpate, locate correct electrode placement positions, read, and interpret both resting and exercise electrocardiography tests.
8. Palpate and correctly measure resting and exercising blood pressure.
9. Palpate and correctly measure resting and exercising heart rate.
10. Quantify fuel utilization in response to various exercise intensities.
11. Accurately administer and interpret various aerobic and anaerobic fitness assessments.
12. Study the physiological responses to environmental stimuli and be able to adjust exercise protocols accordingly.
13. Calibrate and utilize the cycle ergometer and treadmill.

### **STATEMENT CONCERNING LEARNING DISABLED STUDENTS**

If you have special needs regarding testing or note taking please notify the instructor at the beginning of the semester. You will be asked to follow up with written documentation from the appropriate agency. Appropriate accommodations will be made on an individual basis. As a general rule please plan on taking exams on the day and time as posted in the syllabus.

## Exercise Physiology Laboratory Course Schedule

Please note that this is considered a basic course schedule outline that will be followed as closely as possible; however, deviations from the designated schedule may occur. Each student is responsible for keeping up with the class schedule, scheduled changes, and requirements including assigned chapter readings.

<b>Date</b>	<b>Topic</b>	<b>Chapter</b>	<b>Assignment</b>
Week 1	Introduction to Laboratory Methods	Chapters 1-3 and 16-17 and Supplemental Materials	Lab 1: Introduction to Laboratory Methods
Week 2	Anaerobic Metabolism	Chapter 9 and Supplemental Material	Lab 1 Due Lab 2: Anaerobic Metabolism
Week 3	Aerobic Metabolism: Submaximal Cycle Ergometer and Excess Post Exercise Oxygen Consumption	Chapter 14 and Supplemental Material	Lab 2 Due Lab 3: Aerobic Metabolism I
Week 4	Aerobic Metabolism: Submaximal and Maximal Oxygen Consumption ( $VO_{2max}$ )	Chapters 12, 13, and 15 Supplemental Materials	Lab 3 Due Lab 4: Aerobic Metabolism II
Week 5	Fuel Utilization	Supplemental Materials	Lab 4 Due Lab 5: Fuel Utilization
Week 6	Resting and Exercise Electrocardiography	Chapters 18-19 Supplemental Materials	Lab 5 Due Lab 6: Resting and Exercise Electrocardiography
Week 7	Pulmonary Lung Volumes	Chapter 20 Supplemental Material	Lab 6 Due Lab 7: Pulmonary Lung Volumes
Week 8	Lactate and Ventilatory Threshold	Chapter 21 Supplemental Materials	Lab 7 Due Lab 8: Lactate and Ventilatory Threshold
Week 9	Muscular Fatigue and Functional Characteristics of Skeletal Muscle	Chapter 6 Supplemental Material	Lab 8 Due Lab 9: Muscular Fatigue and Functional Characteristics of Skeletal Muscle
Week 10	Thermoregulation	Supplemental Materials	Lab 9 Due Lab 10: Thermoregulation
Week 11	Body Composition	Chapters 23-26 Supplemental Materials	Lab 10 Due
Week 12	Body Composition Continued	Chapters 23-26 Supplemental Materials	Lab 11: Body Composition

Week 13	Fitnessgram	Supplemental Materials	Lab 11 Due Lab 12: Fitnessgram
Week 14	Practical Exam		Lab 12 Due
Week 15	Written Exam		

## References

- Adams, G. M., & Beam, W. C. (2008). *Exercise physiology laboratory manual* (5<sup>th</sup> ed.). New York: McGraw-Hill.
- American College of Sports Medicine. (2006). *ACSM's guidelines for exercise testing and prescription* (7<sup>th</sup> ed.). Philadelphia: Lippincott, Williams & Wilkins.
- American College of Sports Medicine. (2006). *ACSM's resource manual for guidelines for exercise testing and prescription* (5<sup>th</sup> ed.). Philadelphia: Lippincott, Williams & Wilkins.
- ExRx (Exercise Prescription) on the Net. (2008, Sept. 1). <http://exrx.net/>
- Katch, V. L., Katch, F. I., & McArdle, W. D. (2006). *Exercise physiology: Energy, nutrition, and human performance* (6<sup>th</sup> ed.). Philadelphia: Lippincott, Williams & Wilkins.
- Powers, S. K., & Howley, E. T. (2009). *Exercise physiology: Theory and application to fitness and performance* (7<sup>th</sup> ed.). New York: McGraw-Hill.