

GEORGE MASON UNIVERSITY  
School of Recreation, Health, and Tourism

EFHP 610-001- Advanced Exercise Physiology (3)  
Fall 2014

DAY/TIME: T/Th 10:30 – 11:45 am      LOCATION: 302 Occoquan Building  
PROFESSOR: Dr. Charles Robison      EMAIL ADDRESS: crobiso4@gmu.edu  
OFFICE LOCATION: PW 205 Bull Run Hall      PHONE NUMBER: 703-993-7115  
OFFICE HOURS: M/W 1:30 – 3:00pm,  
or by appointment      FAX NUMBER: 703-993-2025

**PREREQUISITES:**

Graduate standing or permission of the instructor

**COURSE DESCRIPTION:**

Lecture, demonstration, and seminar experiences in applying research findings to understanding physiological function and effects of exercise on people.

**COURSE OBJECTIVES:**

Upon completion of EFHP 610 students should be able to:

1. Describe the responses that occur during exercise in the body's various physiological systems
2. Describe the physiological changes that occur as a result of aging and explain how these changes affect performance.
3. Explain how gender differences affect performance
4. Prepare and present research findings on a topic related to a specific area of exercise physiology
5. Demonstrate the ability to critically review current research and connect findings to topics discussed in class.

**COURSE OVERVIEW:**

Topics that are covered include the physiology of the skeletal muscle, cardiorespiratory, and bioenergetic systems. Additional topics to be addressed include: body composition, gender differences, aerobic and anaerobic power, and aging. Material for the course will be drawn from the required textbook and assigned readings of published research. Class lectures will primarily be presented in PowerPoint with files posted on Blackboard in advance of class meetings.

**NATURE OF COURSE DELIVERY**

Face to face

**REQUIRED READINGS:**

Smith, D.L., Fernhall, B. (2011) *Advanced Cardiovascular Exercise Physiology*, Human Kinetics, ISBN-13: 9780736073929

Gardiner, P.F. (2011) *Advanced Neuromuscular Exercise Physiology*, Human Kinetics, ISBN-13: 9781450407212

Kang, J. (2008) *Bioenergetics Primer for Exercise Science*, Human Kinetics, ISBN-13: 9780736062411

**EVALUATION:**

Written Examinations (4)- *Exams will be T/F, multiple-choice and short answer. Each exam will cover approximate one quarter of the semester's material* 65% (Objectives 1,2,3)

Topic Presentation- *A student-selected exercise physiology topic which will be delivered in a 15 presentation. Visual support such as PowerPoint must be used.* 20% (Objectives 4,5)

Article Discussions- *Four student-selected peer-reviewed journal articles will be discussed. A one page abstract will accompany the discussion.* 15% (Objectives 4,5)

**Grading Scale**

|              |              |             |
|--------------|--------------|-------------|
| A = 94 – 100 | B+ = 88 – 89 | C = 70 – 79 |
| A- = 90 – 93 | B = 84 – 87  | F = 0 – 69  |
|              | B- = 80 – 83 |             |

Note:\* Although a B- is a satisfactory grade for a course, students must maintain a 3.00 average in their degree program and present a 3.00 GPA on the courses listed on the graduation application.

**TENTATIVE COURSE SCHEDULE**

| <b>Week</b> | <b>Topic</b>   | <b>Reading</b>  |
|-------------|--|---|
| Week # 1    | Introduction, Energy and Phosphagen System                       | Kang<br><b>Chapter 1</b>  |
| Week # 2    | Glycolysis, Glycogenolysis and Oxidation of Pyruvate and Lactate | Kang<br><b>Chapter 2</b> , Metabolism of Macronutrients During Exercise: Carbohydrate<br><b>Chapter 3</b> , Regulation of Energy Metabolism: Regulation of Substrate Metabolism During Exercise |
| Week # 3    | Lipid Metabolism   | Kang<br><b>Chapter 2</b> , Metabolism of Macronutrients During Exercise: Lipid<br><b>Chapter 3</b> , Regulation of Energy Metabolism: Regulation of Substrate                                   |

|                                |   |  |
|--------------------------------|---|--|
|                                |   | Metabolism During Exercise   |
| Week # 4                       | Protein Metabolism<br>Article Presentations<br><b>Exam 1</b>  | Kang<br><b>Chapter 2</b> , Metabolism of Macronutrients During Exercise: Protein and Amino Acids<br><b>Chapter 3</b> , Regulation of Energy Metabolism: Regulation of Substrate Metabolism During Exercise |
| Week # 5                       | Cardiovascular Anatomy and Physiology   | Smith & Fernhall<br><b>Chapters 1&amp; 2</b>   |
| Week # 6                       | Cardiovascular Anatomy and Physiology, Circulation and Its Control  | Smith & Fernhall<br><b>Chapter 9</b>   |
| Week # 7                       | Circulation and Its Control, Cardiovascular Dynamics During Exercise  | Smith & Fernhall<br><b>Chapter 2</b> , The Heart as a Pump: Cardiac Output<br><b>Chapter 6</b> , Hemodynamics and Peripheral Circulation: Poiseuille's Law, Control of Vasoconstriction and Vasodilation   |
| Week # 8                       | Cardiovascular Dynamics During Exercise, Ventilation<br>Article Presentations<br><b>Exam 2</b>                  | Handout posted on Blackboard   |
| Week # 9                       | Skeletal Muscle Structure and Contractile Properties  | Handout posted on Blackboard   |
| Week # 10                      | Neurons, Motor Unit Recruitment, and Integrative Control of Movement; Principles of Skeletal Muscle Adaptations | Gardiner<br><b>Chapter 1</b>   |
| Week # 11                      | Muscle Strength, Power, and Flexibility<br>Article Presentations<br><b>Exam 3</b>                               | Gardiner<br><b>Chapters 9 &amp; 10</b>   |
| Week # 12                      | Obesity, Body Composition, and Exercise; Exercise in the Heat and Cold  | Kang<br><b>Chapters 6 &amp; 9</b>  |
| Week # 13                      | Growth and Development  | Kang<br><b>Chapter 8</b><br>Handout posted on Blackboard   |
| Week # 14                      | Aging and Exercise<br>Article Discussions   | Kang<br><b>Chapter 8</b><br>Handout posted on Blackboard   |
| Week # 15                      | <b>Exam 4</b>   |  |
| Tuesday, 12/16, 10:30 – 1:15pm | <b>Topic Presentations</b>  |  |

*Note: Faculty reserves the right to alter the schedule as necessary.*

#### *Student Expectations*

- Students must adhere to the guidelines of the George Mason University Honor Code [See <http://oai.gmu.edu/the-mason-honor-code/>].

- Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester [See <http://ods.gmu.edu/>].
- Students must follow the university policy for Responsible Use of Computing [See <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>].
- Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
- Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.

#### *Campus Resources*

- The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance [See <http://caps.gmu.edu/>].
- The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing [See <http://writingcenter.gmu.edu/>].
- For additional information on the College of Education and Human Development, School of Recreation, Health, and Tourism, please visit our website [See <http://rht.gmu.edu>].

**PROFESSIONAL BEHAVIOR:** Students are expected to exhibit professional behaviors and dispositions at all times.

**CORE VALUES COMMITMENT:** The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles.

