

George Mason University
College of Education and Human Development
PhD in Education – Exercise, Fitness, and Health Promotion Specialization
EFHP 810 (002) - Neuromuscular Responses to Exercise
3 Credits, Spring 2019
Bull Run Hall 248, Fridays 12-1:15 p.m.

Faculty

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Prerequisites/Corequisites

Graduate Standing or Permission of Instructor

University Catalog Course Description

Provides an in-depth study of the muscular systems of the human body and how these systems are altered in response to acute and chronic physical activity.

Course Overview

Not Applicable

Course Delivery Method

This course will be delivered using a face-to-face format.

Learner Outcomes or Objectives

This course is designed to enable students to do the following:

- Discuss the pathways and variables associated with energy transfer within muscle cells.
- Elaborate upon the principles of blood delivery and substance exchange within muscular tissue.
- Explain the processes of muscle contraction and the factors affecting force development.
- Assess the relationships among hormone production, secretion, and uptake on muscular tissue.
- Critically interpret current research findings in exercise physiology.

Required Texts

Gardiner PF. *Advanced neuromuscular exercise physiology*. Champaign, IL: Human Kinetics; 2011.

Course Performance Evaluation

Students are expected to submit all assignments on time in the manner outlined by the instructor (e.g., Blackboard, Tk20, hard copy).

Assignments and Examinations

Response essays – Students will write one response essay (7 points each) for all ten units of the course (70 points total). See separate document below for detailed instructions.

Student Presentation – Students will select a topic and critically-interpret current research findings in exercise physiology. This is a student-selected topic within course content which will be delivered in a 20-minute presentation based on current research. Visual support such as PowerPoint must be used.

Course Performance Evaluation Weighting

Requirements	Points
Response Essays	70
Student Presentation	30
Total	100

Grading Policies

The student's final letter grade will be earned based on the following scale:

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

Note: Although a B- is a satisfactory grade for a course, students must maintain a 3.00 average in their degree program.

Professional Dispositions

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: <http://cehd.gmu.edu/values/>.

Class Schedule

Date				Topic	Readings/Assignments Due
#1	F	Jan	25	Introduction	N/A
#2	F	Feb	1	Muscle fibers, motor units, and motoneurons	Chapter 1; essay
#3	F	Feb	8	Motor unit recruitment during different types of movements	Chapter 2; essay
#4	F	Feb	15	Muscle blood flow and metabolism	Chapter 3; essay
#5	F	Feb	22	Peripheral factors in neuromuscular fatigue	Chapter 4; essay
#6	F	March	1	Central factors in neuromuscular fatigue	Chapter 5; essay
#7	F	March	8	Muscular mechanisms in aerobic endurance training	Chapter 6; essay
#8	F	March	15	SPRING BREAK	N/A
#9	F	March	22	Neural mechanisms in aerobic endurance training	Chapter 7; essay
#10	F	March	29	Muscle molecular mechanisms in strength training	Chapter 8; essay
#11	F	April	5	Muscle property changes in strength training	Chapter 9; essay
#12	F	April	12	Neural Mechanisms in strength training	Chapter 10; essay
#13	F	April	19	Student presentations	Student presentations
#14	F	April	26	Student presentations	Student presentations
#15	F	May	3	Student presentations	Student presentations
#16	F	May	10	Student presentations	“Final Exam” (only if needed)

Note: Faculty reserves the right to alter the schedule as necessary, with notification to students.

Response essays

The point of this assignment is to encourage passionate independent study and give fuel for discussion. Students are expected to pick at least one interesting observation from the reading and then do an investigation of that observation using any and all available sources (but, at some point, please include at least one published research study). They should then write a response essay (Times New Roman font, 12-point, single-spaced, standard margins, longer than one full page, with no maximum). There are ten weekly topics, and each essay is worth seven points for a total of 70 points (in other words, this is 70% of your final grade).

In each essay, the student should do the following (as a minimum):

- Begin by clearly-stating at least one interesting finding in your opening sentence.
- Cite that finding very specifically so that others may find it immediately (i.e. page number of text).
- Explain why it was interesting to you initially.
- Write a summary of the rabbit-hole of discovery that you went through. You may include as much detail as you want, but, at a minimum, give a good summary of what you did to learn more after your initial interesting finding.
- Tell us how you feel NOW (i.e. how did your further investigation strengthen or change your opinion?).
- Include references, including website/youtube links (if you choose to use those). For youtube videos, please note any special references (i.e. “at 4:36 the presenter said...”).

These findings will be discussed in class on the day that they are due; therefore, they are due (on Blackboard) by the start of the class session in which we will be discussing them. You also need to bring your notes for the in-class discussion (a hard-copy of your essay is fine) so that you can give specific references.

For the in-class discussion, each student will be expected to give a brief (~1-2 minutes) overview of their independent study. Additionally, while you may not be asked to do so, each student should be prepared to talk at-length about their weekly independent study and answer questions related to it. This is very good extra-preparation for teaching and for presenting research at conferences (especially standing by posters).

Category	Points		Score
Research Idea/Previous Research Summary	0- Unsatisfactory	No summary included	
	1- Minimal	Minimal summary	
	3- Competent	Uncomfortable explaining	
	5- Excellent	Complete grasp/coherency/relevance	
Evidence-Based Explanation of Methods	0- Unsatisfactory	No explanation of methods	
	1- Minimal	Lack of understanding	
	3- Competent	Omits important details to substantiate methods	
	5- Excellent	Student accurately explains and justifies methods used	
Statistics	0- Unsatisfactory	No explanation	
	1- Minimal	Student can explain statistical tests used but not why they are appropriate to test hypothesis/es	
	3- Competent	Student either understands statistical tests used OR why they were appropriate to test hypothesis/es	
	5- Excellent	Clear understanding of statistical test used and why they were appropriate to test hypothesis/es	
Overall/Subject Knowledge/Conclusion	0- Unsatisfactory	Student demonstrates no grasp of topic or uses inaccurate information	
	1- Minimal	Student repeatedly uses unsupported evidence or anecdotal statements	
	3- Competent	Student overlooks needed details	
	5- Excellent	Student demonstrates full grasp of the topic, presenting complete and accurate information	
Organization and Execution	0- Unsatisfactory	No visual aids, incoherent, and unrelated information presented	
	1- Minimal	Not clear, making presentation difficult to follow; no visual aids	
	3- Competent	Slight reorganization needed OR more visual aids needed	
	5- Excellent	Clearly understood presentation and relevant use of visual aids	
Questions	0- Unsatisfactory	Student cannot answer questions or wrong answers	
	1- Minimal	Student can only answer rudimentary questions and answers with poor explanations	
	3- Competent	Answers questions well but fails to elaborate	
	5- Excellent	Student answers all questions clearly	

GMU Policies and Resources for Students

Policies

- Students must adhere to the guidelines of the Mason Honor Code (see <http://oai.gmu.edu/the-mason-honor-code/>).
- 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 Mason 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 with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see <http://ods.gmu.edu/>).
- Students must follow the university policy stating that all sound emitting devices shall be silenced during class unless otherwise authorized by the instructor.

Campus Resources

- Support for submission of assignments to Tk20 should be directed to tk20help@gmu.edu or <https://cehd.gmu.edu/api/tk20>. Questions or concerns regarding use of Blackboard should be directed to <http://coursessupport.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/>).
- 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 Office of Student Support staff helps students negotiate life situations by connecting them with appropriate campus and off-campus resources. Students in need of these services may contact the office by phone (703-993-5376). Concerned students, faculty and staff may also make a referral to express concern for the safety or well-being of a Mason student or the community by going to <http://studentsupport.gmu.edu/>, and the OSS staff will follow up with the student.

For additional information on the College of Education and Human Development, please visit our website <https://cehd.gmu.edu/>.