

**George Mason University**  
**College of Education and Human Development**

Kinesiology

KINE 310 (001) — Exercise Physiology I

3 Credits, Spring 2019

T, TH: 1:30pm – 2:45pm

Bull Run Hall 249 – SciTech Campus

**Faculty**

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**PREREQUISITES**

Undergraduate level BIOL 124 minimum grade of C and undergraduate level BIOL 125 minimum grade of C.  
Co-requisite of KINE 200.

**UNIVERSITY CATALOG COURSE DESCRIPTION**

Introduces students to the physiologic, neuroendocrine, and biochemical changes of the human body that are associated with exercise and work.

**COURSE OVERVIEW**

This course provides a theoretical basis for understanding the body's physiological responses to exercise. Specifically, the course investigates how the support systems of the body (respiratory, cardiovascular, muscular, etc.) function, in cooperation with human energy production to insure that energy is provided for exercise. Emphasis will be placed upon the practical application of exercise physiology principles to coaching, teaching, and other physical training practices.

**COURSE DELIVERY**

The course is a mix of a lecture and discussion course. However, other approaches may be used to facilitate learning. These include: videos, demonstrations and in-class activities. Overall this will be a highly interactive class and students will be encouraged to participate.

**LEARNING OBJECTIVES**

At the completion of the course, students should be able to:

1. Have a theoretical knowledge regarding the physiological responses and capacity for exercise by the human body.
2. Be able to differentiate the physiological metabolic processes that govern human movement and apply each of these processes to physical performance.
3. Be able to compare and contrast the physiological principles of the support systems of the body and appraise how each system is affected by and adapts to exercise.
4. Demonstrate the ability to make recommendations regarding exercise programs based on basic exercise physiology knowledge.
5. Attain knowledge of current issues in exercise physiology research and be able to critically evaluate published literature.

**PROFESSIONAL/ACCREDITATION STANDARDS**

This course meets the Commission on Accreditation of Allied Health Education Programs (CAAHEP) requirements and covers the following American College of Sports Medicine's Knowledge-Skills-

Abilities (KSA's):

KSA	Description	Lecture, Lab or Both
	<b>GENERAL POPULATION/CORE: EXERCISE PHYSIOLOGY AND RELATED EXERCISE</b>	
1.1.9	Ability to describe the systems for the production of energy.	Lecture
1.1.13	Knowledge of the heart rate, stroke volume, cardiac output, blood pressure, and oxygen consumption responses to exercise.	Lecture
1.1.17	Knowledge of the physiological adaptations that occur at rest and during submaximal and maximal exercise following chronic aerobic and anaerobic exercise training.	Lecture
1.1.19	Knowledge of the structure and function of the skeletal muscle fiber.	Lecture
1.1.20	Knowledge of the characteristics of fast and slow twitch muscle fibers.	Lecture
1.1.21	Knowledge of the sliding filament theory of muscle contraction.	Lecture
1.1.22	Knowledge of twitch, summation, and tetanus with respect to muscle contraction.	Lecture
1.1.26	Knowledge of the response of the following variables to acute static and dynamic exercise: heart rate, stroke volume, cardiac output, pulmonary ventilation, tidal volume, respiratory rate, and arteriovenous oxygen difference.	Lecture
1.1.27	Knowledge of blood pressure responses associated with acute exercise, including changes in body position.	Lecture
1.1.31	Knowledge of how the principles of specificity and progressive overload relate to the components of exercise programming.	Lecture
	<b>GENERAL POPULATION/CORE: PATIENT MANAGEMENT AND MEDICATIONS</b>	
1.5.2	Knowledge of the effects of the following substances on the exercise response such as antihistamines, tranquilizers, alcohol, diet pills, cold tablets, caffeine, and nicotine.	
	<b>GENERAL POPULATION/CORE: NUTRITION AND WEIGHT MANAGEMENT</b>	
1.8.1	Knowledge of the role of carbohydrates, fats, and proteins as fuels for aerobic and anaerobic metabolism.	Lecture
1.8.4	Knowledge of the effects of diet, exercise and behavior modification as methods for modifying body composition.	Lecture
1.8.7	Knowledge of the importance of maintaining normal hydration before, during, and after exercise.	Lecture
1.8.14	Knowledge of common nutritional ergogenic aids, the purported mechanism of action, and any risk and/or benefits (e.g., carbohydrates, protein/amino acids, vitamins, minerals, herbal products, creatine, steroids, caffeine).	Lecture
	<b>GENERAL POPULATION/CORE: SAFETY, INJURY PREVENTION, AND EMERGENCY</b>	
1.10.6	Knowledge of the effects of temperature, humidity, altitude, and pollution on the physiological response to exercise and the ability to modify the exercise prescription to accommodate for these environmental conditions.	Lecture

## REQUIRED TEXTS/READINGS

Kenney, W.L., Wilmore, J.H., Costill, D.L. (2015) *Physiology of Sport and Exercise (6th edition)*. Human Kinetics. ISBN-13: 9781450477673.

## SUPPLEMENTARY MATERIAL

Supplementary materials will be used in class and posted on Blackboard.

## 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).

## Evaluation

Evaluation Type	Points	Total
Assignments (6)	30	180
Exams (4)	100	400
Group Presentation	100	100
		680

## Description of Evaluation

**Assignments:** Six assignments will be given throughout the semester which will pertain to subject matter being covered. Details will be provided and posted on Blackboard.

**Exams:** Will be multiple choice, true/false, short answer, and essay. They will be given throughout the semester and cover information lecture and book.

**Group Presentation:** Students will work in groups of 3 to 4 to create a presentation on a topic agreed upon by the students and the instructor. The lecture can be up to 20 minutes (with Q&A). It should be concise and include visual aids. Lecture topics and dates will be determined. Grading will be based on background physiology, etiology, impact of exercise/activity on underlying physiology, current and future research ideas, clarity of presentation, and quality of quiz created. A presentation rubric will be posted on Blackboard.

## Grading Scale

<b>A</b>	<b>4.0</b>	<b>=</b>	<b>93.0 &amp; above</b>
<b>A-</b>	<b>3.7</b>	<b>=</b>	<b>90.0 – 92.9%</b>
<b>B+</b>	<b>3.3</b>	<b>=</b>	<b>87.0 – 89.9%</b>
<b>B</b>	<b>3.0</b>	<b>=</b>	<b>83.0 – 86.9%</b>
<b>B-</b>	<b>2.7</b>	<b>=</b>	<b>80.0 – 82.9%</b>
<b>C+</b>	<b>2.3</b>	<b>=</b>	<b>77.0 – 79.9%</b>
<b>C</b>	<b>2.0</b>	<b>=</b>	<b>73.0 – 76.9%</b>
<b>C-</b>	<b>1.7</b>	<b>=</b>	<b>70.0 – 72.9%</b>
<b>D</b>	<b>1.0</b>	<b>=</b>	<b>60.0 – 69.9%</b>
<b>F</b>	<b>0.0</b>	<b>=</b>	<b>0.0 – 59.9%</b>

## Make-up Policy

- For every day an assignment is late a drop in one letter grade will be applied. (Ex: An assignment that is one day late will start at a grade of a B+, 2 days late a C+, etc....)
- Exams which are due to unexcused absences will not be allowed a make-up exam.
- Make-up exams and assignments will only be offered for those who possess a University sanctioned excuse or doctor's note.

## Cell Phones:

- Must be turned off at the beginning of class and texting in class will not be tolerated. I don't even want to see them out on the desk for ANY reason.
- You get ONE WARNING; further cell phone use will result in a 5 point reduction on the next exam.
- For repeated offenses the student will be removed from the classroom and a drop in one whole letter grade will result. (i.e. A to B+)
- Texting during an exam warrants immediate expulsion from class and zero will be given for a grade.
- If you have an emergency situation and your cell phone needs to be on please inform the professor at the beginning of the class.

## PROFESSIONAL DISPOSITIONS

See <https://cehd.gmu.edu/students/polices-procedures/>

Students are held to the standards of the George Mason University Honor Code. You are expected to attend all class sections, actively participate in class discussions, complete in-class exercises and fulfill all assignments. Make-up tests, quizzes, assignments, or other grades will be granted for excused absences only. Excused absences include: serious illness, official university excused absences and extenuating circumstances. It is the student's responsibility to contact the instructor in order to obtain the make-up work.

## 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/>.

## 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](mailto:tk20help@gmu.edu) or <https://cehd.gmu.edu/aero/tk20>. Questions or concerns regarding use of Blackboard should be directed to <http://coursesupport.gmu.edu/>.
- For information on student support resources on campus, see <https://ctfe.gmu.edu/teaching/student-support-resources-on-campus>

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

### **Academic Integrity**

GMU is an Honor Code University; please see the University Catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? First, it means that when you are responsible for a task, you will be the one to perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives and traditions. When in doubt, please ask for guidance and clarification.

## TENTATIVE SCHEDULE

1/22	Syllabus & Intro	
1/24	Energy Systems	Ch. 2
1/29	Energy Systems & Exercise	
1/31	Energy Systems & Exercise	
2/5	Energy Expenditure & Fatigue	Ch. 5
2/7	Energy Expenditure & Fatigue	
2/12	<b>Exam 1</b>	
2/14	<i>Group Presentation #1</i> Nervous System and Exercise	Ch. 3
2/19	Nervous System and Exercise	
2/21	Neuromuscular (Skeletal Muscle)	Ch. 1 & 3
2/26	Neuromuscular (Skeletal Muscle)	
2/28	<i>Group Presentation #2</i> Neuromuscular Responses to Exs.	
3/5	Adaptations to Resistance Training	Ch. 10
3/7	<b>Exam 2</b>	
3/12	<i>Spring Break</i>	
3/14	<i>Spring Break</i>	
3/19	Cardiorespiratory System	Ch. 6 & 7
3/21	Cardiorespiratory System and Exercise	
3/26	Cardiorespiratory Control During Exs.	
3/28	Cardiorespiratory Responses to Acute Exs.	Ch. 8
4/2	<i>Group presentation #3</i> Cardiorespiratory Responses to Acute Exs.	Ch. 8

4/4	<b>Exam 3</b>	
4/9	Adaptations to Aerobic & Anaerobic Training	Ch. 11
4/11	Adaptations to Aerobic & Anaerobic Training	
4/16	<i>Group presentation #4</i> Gender Differences	Ch. 19
4/18	Ergogenic Aids	Ch. 16
4/23	Ergogenic Aids	
4/25	The Environment and Ex.	Ch. 12
4/30	The Environment and Ex.	Ch. 13
5/2	<i>Group Presentation # 5</i> Catch up day/Review	

**Exam 4 will be held during our scheduled final exam time – May 14<sup>th</sup>, 1:30 p.m.**

*Note: The instructor reserves the right to make changes to the course syllabus and/or schedule at any time. Students will always be informed of any changes made*

