George Mason University
College of Education and Human Development
Kinesiology
KINE 310 (003) — Exercise Physiology I
3 Credits, Fall 2019
T, TH: 10:30am – 11:45pm
Colgan Hall 204 – 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
	GENERAL POPULATION/CORE: EXERCISE PHYSIOLOGY AND RELATED EXERCISE	
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
	GENERAL POPULATION/CORE: PATIENT MANAGEMENT AND MEDICATIONS	
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.	
	GENERAL POPULATION/CORE: NUTRITION AND WEIGHT MANAGEMENT	
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
	GENERAL POPULATION/CORE: SAFETY, INJURY PREVENTION, AND EMERGENCY	
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 (4)	30	120
Book Quizzes (4)	30	120
Exams (4)	100	400
Group Presentation	100	100
		740

Description of Evaluation

Book Quizzes: Throughout the semester online quizzes will be posted on Blackboard directly pertaining to the chapter being covered. These quizzes will be assigned and due prior to topic being covered in class. The goal for these quizzes is for you to come to class prepared with some of the basic information so lecture will be focused on application.

Assignments: Four 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:
A 15-20 minute group presentation reviewing the demands of an Olympic Sport of your choosing. https://www.olympic.org/sports
Content should include:

- The contribution of and importance of the energy systems
- The amount of training time needed for change, and what physiological changes are occurring during this time. Including all the key systems: musculoskeletal, cardiovascular and neurological.
- Typical physiological data needing to be collected for these athletes when assessing their fitness and performance level. What does that information tell us about the systems listed above?

A rubric will be provided on Blackboard.

Grading Scale

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

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 or https://cehd.gmu.edu/aero/tk20. Questions or concerns regarding use of Blackboard should be directed to http://coursessupport.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

Date		Topic & potential in class assignments	
Aug	27	Syllabus & Intro	
Aug	29	Energy Systems	Ch. 2
Sept	3	Energy Systems & Exercise	Assignment 1: E.S.
Sept	5	Energy Systems and Exercise	Book Quiz Ch. 5
Sept	10	Energy Expenditure & Fatigue	Ch. 5
Sept	12	Energy Expenditure & Fatigue	
Sept	17	**Exam 1**	
Sept	19	Nervous System and Exercise	Book Quiz Ch. 3
Sept	24	Nervous System and Exercise	Assignment 2: N.S.
Sept	26	Neuromuscular (Skeletal Muscle)	Book Quiz Ch. 1
Oct	1	Neuromuscular (Skeletal Muscle)	
Oct	3	Neuromuscular Responses to Exercise	
Oct	8	Adaptations to Resistance Training	Ch. 10
Oct	10	**Exam 2**	
Oct	15	Cardiovascular System & Exercise	Book Quiz Ch. 6
Oct	22	Cardiovascular Control During Exercise	
Oct	24	Respiratory System & Exercise	Book Quiz Ch. 7
Oct	29	Respiratory System & Exercise	
Oct	31	Cardiorespiratory responses to acute exercise	Ch. 8
Nov	5	Cardiorespiratory Responses to acute exercise	Assignment 3

Nov	7	**Exam 3**	
Nov	12	Adaptations to Aerobic & Anaerobic Training	Ch. 11
Nov	14	Adaptations to Aerobic & Anaerobic Training	Assignment 4
Nov	19	The Environment and Exercise: Heat & Cold	Ch. 12
Nov	21	The Environment and Exercise: Heat & Cold	
Nov	26	The Environment and Exercise: Altitude	Ch. 13
Nov	28	Thanksgiving Recess	
Dec	3	Group Presentations	
Dec	5	Group Presentations	

Exam 4 will be held during our scheduled final exam time – December 17th 10:30 a.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

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