

George Mason University
College of Education and Human Development
Kinesiology
KINE 310 (001) — Exercise Physiology I
3 Credits, Fall 2023
M, W: 1:30pm – 2:45pm
Kathrine Johnson Hall 134, SciTech Campus

Faculty

Name: James Kearney
Office Hours: By Appointment
Office Location: By Appointment
Email Address: jkearne@gmu.edu

PREREQUISITES

Undergraduate level BIOL 124 minimum grade of C and undergraduate level BIOL 125 minimum grade of C.
Co-requisite of KINE 311.

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	Lecture
1.1.20	Knowledge of the characteristics of fast and slow twitch muscle	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	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 (8th edition)*. Human Kinetics

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
Labs (3)	5	15
Case Studies (4)	5	20
Quizzes (18)	1	18
Midterm	12	12
Group Presentation	15	15
Final Exam	20	20
		100

Description of Evaluation

Quizzes: Each class's online quizzes will be posted on Blackboard directly pertaining to the content covered that day. These quizzes will be assigned and due 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. Quiz content will consist of recorded lecture content and the days chapter material

Assignments: Assignments and labs 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 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.

Late Work Policy:

No late work will be accepted in this course without a submitted extension request. The extension request must be submitted in place of the assignment, to the course instructor, by the assignment deadline. Extension requests must be submitted with an explanation as to why the student is unable to complete the assignment on time. No extension requests will be granted if submitted after the assignment deadline. Students are allowed one 24-hour extension per course. Extensions approved beyond 24 hours are at the discretion of the instructor. Extensions cannot be requested for lab practicals, exams or presentations. In dire or extenuating circumstances, students may be allotted additional extensions or make up opportunities at the instructor's discretion with a possible point reduction of 20% for every day the assignment is late.

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%

Do I round up? I only round up if your grade is over the xx.9%. Please do not email me at the end of the semester asking if I will found up your grade or for extra credit. Put your best effort into the assignments and quizzes during the semester.

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.

Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking:

As a faculty member, I am designated as a "Responsible Employee," and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason's confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance from Mason's Title IX Coordinator by calling 703-993-8730, or emailing titleix@gmu.edu.

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

AFE RETURN TO CAMPUS STATEMENT

All students taking courses with a face-to-face component are required to follow the university's public health and safety precautions and procedures outlined on the university Safe Return to Campus webpage

<https://www2.gmu.edu/safe-return-campus>). Similarly, all students in face-to-face and hybrid courses must also complete the Mason COVID Health Check daily, seven days a week. The COVID Health Check system uses a

color code system and students will receive either a Green, Yellow, Red, or Blue email response. Only students who receive a “green” notification are permitted to attend courses with a face-to-face component. If you suspect that you are sick or have been directed to self-isolate, please quarantine or get testing. Faculty are allowed to ask you to show them that you have received a Green email and are thereby permitted to be in class.

Students are required to follow Mason's current policy about facemask-wearing. As of August 11, 2021, all community members are required to wear a facemask in all indoor settings, including classrooms. An appropriate facemask must cover your nose and mouth at all times in our classroom. If this policy changes, you will be informed; however, students who prefer to wear masks will always be welcome in the classroom.

The Kinesiology program is an intentionally inclusive community, that promotes and maintains an equitable and just work and learning environment. We welcome and value individuals and their differences including race, economic status, gender expression and identity, sex, sexual orientation, ethnicity, national origin, first language, religion, age, and disability.

CELL PHONES & LAPTOPS

Cell phones and other communicative devices are not to be used during class. Please keep them stowed away and out of sight. Laptops or tablets may be permitted for the purpose of taking notes only, Engaging in activities not related to the course (e.g., gaming, email, chat, etc.) will result in a significant reduction in your participation grade. Please be respectful of your peers and your instructor and do not engage in activities that are unrelated to class. Such disruptions show a lack of professionalism.

TENTATIVE SCHEDULE

Date		Topic	Reading	Assignments
Week 1	8/21	Syllabus & Introduction to Exercise Physiology		
	8/23	Energy Systems	Ch. 2	Quiz 1
Week 2	8/28	Energy Systems & Exercise		Quiz 2
	8/30	Energy Systems & Exercise		Quiz 3 Case 1-Due Sunday
Week 3	9/4	Labor Day, No Class		
	9/6	Energy Expenditure & Fatigue	Ch. 5	Quiz 4
Week 4	9/11	Energy Expenditure & Fatigue		Lab 1 – Energy Metabolism
	9/13	Nervous System & Exercise	Ch. 3	Quiz 5
Week 5	9/18	Nervous System & Exercise		Quiz 6 Case 2-Due Sunday

	9/20	Skeletal Muscle	Ch. 1	Quiz 7
Week 6	9/25	Skeletal Muscle		Quiz 8
	9/27	Adaptations to Resistance Training	Ch. 11	Quiz 9
Week 7	10/2	Adaptations to Resistance Training		Quiz 10
	10/4	Review Class		
Week 8	10/9	Fall Break, Class is on Tue 10/10. Mid-term		Mid-term
	10/11	Cardiovascular Control During Exercise	Ch. 6	Quiz 11
Week 9	10/16	Cardiovascular Control During Exercise		Quiz 12 Case 3-Due Sunday
	10/18	Respiratory System & Exercise	Ch. 7	Quiz 13
Week 10	10/23	Respiratory System & Exercise		Quiz 14
	10/25	Cardiorespiratory responses to acute exercise	Ch. 8	Quiz 15
Week 11	10/30	Cardiorespiratory responses to acute exercise		Quiz 16
	11/1	Adaptations to Aerobic & Anaerobic Training	Ch. 11	Lab: Aerobic
Week 12	11/6	Adaptations to Aerobic & Anaerobic Training		Lab: Anaerobic
	11/8	The Environment and Exercise: Heat & Cold	Ch. 12	Quiz 17
Week 13	11/13	The Environment and Exercise: Heat & Cold		Quiz 18
	11/15	The Environment and Exercise: Altitude		Quiz 19
Week 14	11/20	Group Presentations		Group Prez. Due at Class Time
	11/22	Thanksgiving Break, No Class		
Week 15	11/27	Group Presentations		Final Case- Due Sunday
	11/29	Final Exam Review		
Week 16	12/4	December 4 th and 5 th Reading Days		

	12/6	Final Exam		
--	------	------------	--	--

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