

George Mason University
College of Education and Human Development
Kinesiology
KINE 310_001 — Exercise Physiology I
3 Credits, Fall 2021
M,W: 1:30am – 2:45pm
KJH 132 – 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

This course will be delivered in a hybrid format with 50% of the class being online using the Blackboard learning management system (LMS) housed in the MyMason portal. The other 50% of the class being in person. You will log in to the Blackboard course site using your Mason email name (everything before @masonlive.gmu.edu) and email password. The course site will be available on August 23, 2021.

Under no circumstances, may candidates/students participate in online class sessions (either by phone or Internet) while operating motor vehicles. Further, as expected in a face-to-face class meeting, such online participation requires undivided attention to course content and communication.

Technical Requirements

To participate in this course, students will need to satisfy the following technical requirements:

- High-speed Internet access with a standard up-to-date browser, either Internet Explorer or Mozilla Firefox is required (note: Opera and Safari are not compatible with Blackboard).
- Students must maintain consistent and reliable access to their GMU email and Blackboard, as these are the official methods of communication for this course.
- Students may be asked to create logins and passwords on supplemental websites and/or to download trial software to their computer or tablet as part of course requirements.
- The following software plug-ins for PCs and Macs, respectively, are available for free download: [Add or delete options, as desire.]
 - Adobe Acrobat Reader: <https://get.adobe.com/reader/>

- Windows Media Player: <https://windows.microsoft.com/en-us/windows/downloads/windows-media-player/>
- Apple Quick Time Player: www.apple.com/quicktime/download/ Expectations

Expectations:

- **Course Week:** Our course week will begin on Monday and end on Thursday. Although no scheduled meetings will occur on Friday, Saturday or Sunday you may need these days to complete assignments or prepare for lecture.
- **Log-in Frequency:** Students must actively check the course Blackboard site and their GMU email for communications from the instructor, class discussions, and/or access to course materials at least 3 times per week.
- **Participation:** Students are expected to actively engage in all course activities throughout the semester, which includes viewing all course materials, completing course activities and assignments, and participating in course discussions and group interactions.
- **Technical Competence:** Students are expected to demonstrate competence in the use of all course technology. Students who are struggling with technical components of the course are expected to seek assistance from the instructor and/or College or University technical services.
- **Technical Issues:** Students should anticipate some technical difficulties during the semester and should, therefore, budget their time accordingly. Late work will not be accepted based on individual technical issues.
- **Workload:** Please be aware that this course is not self-paced. Students are expected to meet specific deadlines and due dates listed in the Class Schedule section of this syllabus. It is the student's responsibility to keep track of the weekly course schedule of topics, readings, activities and assignments due.
- **Instructor Support:** Students may schedule a one-on-one meeting to discuss course requirements, content or other course-related issues. Those unable to come to a Mason campus can meet with the instructor via telephone or web conference. Students should email the instructor to schedule a one-on-one session, including their preferred meeting method and suggested dates/times.
- **Netiquette:** The course environment is a collaborative space. Experience shows that even an innocent remark typed in the online environment can be misconstrued. Students must always re-read their responses carefully before posting them, so as others do not consider them as personal offenses. Be positive in your approach with others and diplomatic in selecting your words. Remember that you are not competing with classmates, but sharing information and learning from others. All faculty are similarly expected to be respectful in all communications.
- **Accommodations:** Online learners who require effective accommodations to insure accessibility must be registered with George Mason University office of disability services.

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
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REQUIRED TEXTS/READINGS

Kenney, W.L., Wilmore, J.H., Costill, D.L. (2015) *Physiology of Sport and Exercise (7th 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
Attendance (10)	5	50
Participation (10)	10	100
Lecture Comprehension (13)	25	325
Exams (4)	100	400
Group Project	100	100
		975

Description of Evaluation

Attendance: You are expected to attend each face to face session for this course. Attendance will be taken and scored for each.

Participation: During each face to face session we will be applying knowledge from lecture to activities, case studies, and worksheets. These will be handed in and scored to document your engagement and understanding during class time.

Lecture Comprehension: For each set of online lectures you will have a set of questions to answer that will assess your understanding and comprehension of the lecture material. The questions will be a mix of short answer and fill in the blank. These comprehension tasks may sometimes ask for you to make connections to popular trends and topics within the exercise physiology field.

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

Group Project:

You will create a document going over the information below on 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?

You will present to the class for 5-10 mins an aspect of your project. The focus of the presentation will be to teach us about one important physiological adaptation that occurs with these athletes covering the how and why.

More information will be provided during class as well as a posting of a rubric to follow.

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.

Exams and Presentations: Make up for exams and presentation will follow university sanctioned excuses. This will also be per the discretion of the instructor and the instructor should be notified prior to exam/presentation day.

Grading Scale

A+	97.0 & above
A	93.0 - 96.9%
A-	90.0 – 92.9%
B+	87.0 – 89.9%
B	83.0 – 86.9%
B-	80.0 – 82.9%
C+	77.0 – 79.9%
C	73.0 – 76.9%
C-	70.0 – 72.9%
D	60.0 – 69.9%
F	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.

CLASS SCHEDULE

Date		Topic	Assignments
Aug	23	Class Introduction Online Lecture: Ch. 2 Energy Systems	Lecture Comprehension 1
Aug	25	F2F: Energy Systems Discussion & Activity	
Aug	30	Online Lecture: Ch. 2 Energy Systems & Exercise	Lecture Comprehension 2
Sept	1	F2F: Energy Systems & Exercise Activity	
Sept	6	Online lecture: Ch. 5 Energy Expenditure & Fatigue Lecture	Lecture Comprehension 3
Sept	8	F2F: Energy Expenditure & Fatigue Activity	
Sept	13	Online Lecture: Ch. 3 Nervous System & Exercise	Lecture Comprehension 4
Sept	15	F2F: Exam 1 – Ch. 2 & 5	
Sept	20	Online Lecture: Ch. 3 Nervous System	Lecture Comprehension 5
Sept	22	F2F: Nervous System & Exs Activity	
Sept	27	Online Lecture: Ch. 1 Skeletal Muscle & Neuromuscular Systems	Lecture Comprehension 5
Sept	29	F2F: Muscle Ch. Activity	
Oct	4	Online Lecture: Ch. 10 Adaptations to Resistance Training	Lecture Comprehension 6
Oct	6	F2F: Adaptations review & activity	
Oct	11	Online Lecture: Ch. 6 Cardiovascular System & Exercise	Lecture Comprehension 7
Oct	13	F2F Exam 2 – Ch. 1, 3, 10	
Oct	18	Online Lecture: Ch. 6 Cardiovascular Control During Exercise	Lecture Comprehension 8
Oct	16	F2F: Cardiovascular System Review & Activity	
Oct	25	Online Lecture: Ch. 7 Respiratory System & Exercise	Lecture Comprehension 9

Oct	27	F2F: Respiratory System & Exs Review & Activity	
Nov	1	Online Lecture: Ch. 8 Cardiorespiratory Responses to Acute Exercise	Lecture Comprehension 10
Nov	3	F2F: Cardiorespiratory Review & Activity	
Nov	8	Online lecture: Ch. 11 Adaptations to Aerobic & Anaerobic Training	Lecture Comprehension 11
Nov	10	F2F: Exam 3 Ch. 6, 7, 8	
Nov	15	Online lecture: Ch. 12 The Environment & Exercise: Heat & Cold	Lecture Comprehension 12
Nov	17	F2F: Adaptations & Environmental Topics	
Nov	22	Online Lecture: Ch. 13 The Environment & Exercise: Altitude	Lecture Comprehension 13
Nov	25	Thanksgiving Recess	
Nov	29	Online lecture: Catch Up Day/Presentation Prep	
Dec	1	F2F: Group Project Presentations	Group Projects Due

****Exam 4 will be held during our scheduled final exam time – Wednesday, December 8th 10:30 a.m.****

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

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 <https://catalog.gmu.edu/policies/honor-code-system/>).
- Students must follow the university policy for Responsible Use of Computing (see <https://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 <https://ds.gmu.edu/>).
- Students must silence all sound emitting devices 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 <https://its.gmu.edu/knowledge-base/blackboard-instructional-technology-support-for-students/>.
- For information on student support resources on campus, see <https://ctfe.gmu.edu/teaching/student-support-resources-on-campus>

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/>.