George Mason University
College of Education and Human Development
Kinesiology
KINE 310 DL1 — Exercise Physiology I
3 Credits, Fall 2021
Online

Instructor
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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.

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 standard up-to-date browsers. To get a list of Blackboard's supported browsers see:
https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support#supportedbrowsers
To get a list of supported operation systems on different devices see:

https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support#testeddevices-and-operating-systems

• 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:
    o Adobe Acrobat Reader: https://get.adobe.com/reader/
    o Windows Media Player: https://support.microsoft.com/en-us/help/14209/get-windows-media-player
    o Apple Quick Time Player: www.apple.com/quicktime/download/

Expectations

• Course Week: This course is an online asynchronous course. Online, asynchronous courses do not have a "fixed" meeting day each week, our week will start on 12:01am EST on Monday and end at 11:59pm EST on the following Sunday.

• To help you manage your schedule and time to complete the assignments in this course, please follow the recommended timeline below. If you have a question or concerns or encounter a problem about an assignment, please contact me immediately so we can figure out a solution.

• 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 or on blackboard. 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 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 ensure accessibility must be registered with George Mason University 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 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 or 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 Type	Points	Total
Introduction discussion board	5	5
Weekly discussion board/ scholarly article (11)	15	165
Weekly chapter quiz (11)	30	330
Exams (4)	100	400
Final Project (1)	100	100

Assignments and/or Examinations

Assignments:
There will be 11 assignments due over the course of the semester they will vary from reading articles, creating discussion boards, completing handouts etc. Detail for these assignments will be posted to blackboard.

Chapter quizzes:
Online quizzes will be posted on Blackboard directly pertaining to the chapter being covered. The goal for these quizzes is to ensure the completion of the chapter outline and lecture videos.

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

Final Project:
A 15-20 minute group presentation reviewing the demands of an Olympic Sport of your choosing. (Presentation will be record and submitted via blackboard).
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

A	**94 – 100**
A-	**90 – 93**
B+	**88 – 89**
B	**84 – 87**
B-	**80 – 83**
C+	**78 – 79**
C	**74 – 77**
C-	**70 – 73**
D	**60 – 69**
F	**0 – 59**

Make-up Policy

No late work will be accepted in this course without a submitted extension request. The extension request must be submitted via email or in place of the assignment 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 during this 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.

Emails/Questions about grades

- Please wait 24 hours to email questions about grading. I will not reply to any emails sent within this time period.
- If you wish to question/dispute a grade, you must do so within one week of the grade being posted. Any questions/disputes after this time period will not be considered. Please do so in a professional manner.

Professional Dispositions
See https://cehd.gmu.edu/students/polices-procedures/

Tentative Schedule

Date	Topic	Assignments
Week 1 8/23-8/29	Syllabus & Intro Chapter 1: Structure and function of the exercising muscle	Chapter 1 quiz & Assignment 1 **Due 8/29 at 11:59pm**
Week 2 8/30-9/5	Chapter 3: Neural control of exercising muscle	Chapter 3 quiz & Assignment 2 **Due 9/5 at 11:59pm**

Week 3 9/6-9/12	Chapter 2: Bioenergetics and muscle metabolism	Chapter 2 quiz & Assignment 3 **Due 9/12 at 11:59pm**
Week 4 9/13-9/19	Chapter 5: Energy expenditure, fatigue, and muscle soreness	Chapter 5 quiz & Assignment 4 **Due 9/19 at 11:59pm**
Week 5 9/20-9/26	Exam 1	
Week 6 9/27-10/3	Chapter 6: Cardiovascular system and its control	Chapter 6 quiz & Assignment 5 **Due 10/3 at 11:59pm**
Week 7 10/4-10/10	Chapter 7: Respiratory system and its regulations	Chapter 7 quiz & Assignment 6 **Due 10/10 at 11:59pm**
Week 8 10/11-10/17	Chapter 8: Cardiorespiratory response to acute exercise	Chapter 8 quiz & Assignment 7 **Due 10/17 at 11:59pm**
Week 9 10/18-10/24	Exam 2	
Week 10 10/25-10/31	Chapter 10: Adaptations to resistance training	Chapter 10 quiz & Assignment 8 **Due 10/31 at 11:59pm**
Week 11 11/1-11/7	Chapter 11: Adaptations to Aerobic and Anaerobic Training	Chapter 11 quiz & Assignment 9 **Due 11/7 at 11:59pm**
Week 12 11/8-11/14	Chapter 12: Exercise in hot & cold environment	Chapter 12 quiz & Assignment 10 **Due 11/14 at 11:59pm**
Week 13 11/15-11/21	Chapter 13: Exercise at altitude	Chapter 13 quiz & Assignment 11 **Due 11/14 at 11:59pm**
Week 14 11/22-11/28	Exam 3	
Week 15 11/29-12/5	Final Group Project Videos	Final Project **Video Due 12/2 at 8:00pm** **Manual Due 12/4 at 5:00pm**
Week 16 12/8-12/15	Final Exam	**TBA**

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

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/

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/).

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-technologysupport-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/ .