

George Mason University
College of Education and Human Development
School of Kinesiology

KINE 310 - DL2 - Exercise Physiology I
3.0 Credits, Spring, 2021
Online Only

Faculty

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PREREQUISITES

Undergraduate level BIOL 124 & 125 - minimum grade of C.

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 ensure 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#supported-browsers

To get a list of supported operation systems on different devices see:

https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support#tested-devices-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:
 - Adobe Acrobat Reader: <https://get.adobe.com/reader/>
 - Windows Media Player: <https://support.microsoft.com/en-us/help/14209/get-windows-media-player>
 - 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	Description
	GENERAL POPULATION/CORE: EXERCISE PHYSIOLOGY AND RELATED EXERCISE SCIENCE
1.1.9	Ability to describe the systems for the production of energy.
1.1.13	Knowledge of the heart rate, stroke volume, cardiac output, blood pressure, and oxygen consumption responses to exercise.
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.
1.1.19	Knowledge of the structure and function of the skeletal muscle fiber.
1.1.20	Knowledge of the characteristics of fast and slow twitch muscle fibers.
1.1.21	Knowledge of the sliding filament theory of muscle contraction.

1.1.22	Knowledge of twitch, summation, and tetanus with respect to muscle contraction.
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.
1.1.27	Knowledge of blood pressure responses associated with acute exercise, including changes in body position.
1.1.31	Knowledge of how the principles of specificity and progressive overload relate to the components of exercise programming.
	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.
1.8.4	Knowledge of the effects of diet, exercise and behavior modification as methods for modifying body composition.
1.8.7	Knowledge of the importance of maintaining normal hydration before, during, and after exercise.
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).
	GENERAL POPULATION/CORE: SAFETY, INJURY PREVENTION, AND EMERGENCY PROCEDURES
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.

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.

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
Weekly Chapter Outline & Assignments (12)	25	300
Weekly Chapter Quizzes (12)	25	300
Module Exams (4)	100	400
		1000

- **Assignments and Examinations**

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.

Assignments: assignments will be included at the end of each chapter outline and will pertain to the application of the subject matter being covered.

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.

Grading Scale

A	4.0	=	93.0 -- 100%	C+	2.3	=	77.0 – 79.9%
A-	3.7	=	90.0 – 92.9%	C	2.0	=	73.0 – 76.9%
B+	3.3	=	87.0 – 89.9%	C-	1.7	=	70.0 – 72.9%
B	3.0	=	83.0 – 86.9%	D	1.0	=	60.0 – 69.9%
B-	2.7	=	80.0 – 82.9%	F	0.0	=	0.0 – 59.9%

Professional Dispositions

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

Class Schedule

DATE	TENTATIVE TOPIC	ASSIGNMENTS DUE	Points
MODULE #1: Principles of Exercise Training			
Week 1: 1/25	Introduction / Ch. 9 (Principles of Exercise Training)	Outline / Quiz	25 / 25
Week 2: 2/1	Ch. 1 (Structure and Function of Exercising Muscle)	Outline / Quiz	25 / 25
Week 3: 2/8	Ch. 11 (Adaptations to Aerobic and Anaerobic Training)	Outline / Quiz	25 / 25
Week 4: 2/15	Review / Exam 1	Exam #1	100
MODULE #2: Energy Systems			
Week 5: 2/22	Ch. 2 (Fuel for Exercise: Bioenergetics and Muscle Metabolism)	Outline / Quiz	25 / 25
Week 6: 3/1	Ch. 5 (Energy Expenditure, Fatigue, and Muscle Soreness)	Outline / Quiz	25 / 25
Week 7: 3/8	Chapter 15 & 16. (Body Composition & Ergogenic Aids)	Outline / Quiz	25 / 25

Week 8: 3/15	Review / Exam 2	Exam #2	100
MODULE #3: Cardiovascular System			
Week 9: 3/22	Chapter 6. The Cardiovascular System and Its Control	Outline / Quiz	25 / 25
Week 10: 3/29	Chapter 7. The Respiratory System and Its Regulation	Outline / Quiz	25 / 25
Week 11: 4/5	Chapter 8. Cardiorespiratory Responses to Acute Exercise	Outline / Quiz	25 / 25
Week 12: 4/12	Review / Exam 3	Exam #3	100
MODULE #4: Environmental Influences			
Week 13: 4/19	Chapter 12 & 13. Exercise in Hot / Cold / Altitude Environments	Outline / Quiz	50 / 50
Week 14: 4/26	Chapter 20. Prescription of Exercise for Health and Fitness	Outline / Quiz	25 / 25
Week 15: 5/3	Review / Exam 4	Exam #4	100
		Total:	1000

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/>.

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/>.



REMOTE LEARNING GUIDANCE FOR STUDENTS ENROLLED IN CEHD COURSES

Both a Safe Return to Campus and Successful Remote Learning Depend on YOU.

All students are required to take Safe Return to Campus Training prior to visiting campus: it is, however, recommended for all Mason students. Training is available in Blackboard.

Students are required to follow the university's public health and safety precautions and procedures outlined on the university Safe Return to Campus webpage.

All students in face to face and hybrid courses must also complete the Mason COVID Health Check daily, seven days a week.

You may not come to class if you receive a Yellow or Red email response to the Mason COVID Health Check.

You may only come to class if you receive a Green email response to the Mason COVID Health Check.

If you suspect that you are sick or have been directed to self-isolate, quarantine, or get testing do not go to class.

Faculty are allowed to ask you to show them that you have received a Green email and are thereby permitted to be in class.

Disability Services: Students unable to participate in a course in the manner presented, either due to existing disability or COVID comorbidity risk, should seek accommodations through the Office of Disability Services.

Campus Closure: If the campus closes or class is canceled due to weather or other concerns, students should check Blackboard, Mason email, or the Mason website for updates on how to continue learning and information about any changes to events or assignments.

Participation and Make-up Work: CEHD instructors will work with students to find reasonable opportunities to make up class work or assignments missed due to documented illness. Begin by contacting your instructor for guidance. For further assistance, students may contact their program and the CEHD Office of Student and Academic Affairs (cehdsaa@gmu.edu).

Technology Requirements:

Activities and assignments in CEHD courses regularly use the Blackboard learning system. Students are required to have regular, reliable access to a computer with an updated operating system (recommended: Windows 10 or Mac OSX 10.13 or higher) and a stable broadband Internet connection (cable modem, DSL, satellite broadband, etc., with a consistent 1.5 Mbps [megabits per second] download speed or higher. Additionally, CEHD course activities and assignments may regularly use web- conferencing software (Blackboard Collaborate / Zoom). In addition to the requirements above, students are required to have a device with a functional webcam and microphone. In an emergency, students can connect through a telephone call, but video connection is the expected norm.

Course Materials and Student Privacy:

All course materials posted to Blackboard or other course site are private; by federal law, any materials that identify specific students (via their name, voice, or image) must not be shared with anyone not enrolled in this class.

Video recordings of class meetings that include audio or visual information from other students are private and must not be shared.

Live Video Conference Meetings (e.g. Collaborate or Zoom) that include audio or visual information from other students must be viewed privately and not shared with others in your household.

Some/All of your CEHD synchronous class meetings may be recorded by your instructor to provide necessary information for students in this class. Recordings will be stored on Blackboard [or another secure site] and will only be accessible to students taking this course during this semester.

Testing with LockDown Browser:

CEHD courses may require the use of LockDown Browser and a webcam for online exams. The webcam can be built into your computer (internal webcam) or can be the type of webcam that plugs in with a USB cable (external webcam). Information on installing and using LockDown Browser may be found here.

You will need the following system requirements for online exams:

Windows: 10, 8, 7

Mac: OS X 10.10 or higher

iOS: 10.0+ (iPad only)

Must have a compatible LMS integration

Web camera (internal or external) & microphone

A reliable internet connection

Prior to your first exam, you must install LockDown Browser following the step-by-step instructions linked above.

To ensure LockDown Browser and the webcam are set up properly, do the following:

Start LockDown Browser, log into Blackboard and select your course.

Locate and select the Help Center button on the LockDown Browser toolbar.

Run the Webcam Check and, if necessary, resolve any issues or permissions your computer prompts.

Run the System & Network Check. If a problem is indicated, see if a solution is provided in the Knowledge Base. Further troubleshooting is available through the ITS Support Center.

Exit the Help Center and locate the practice quiz.

Upon completing and submitting the practice quiz, exit LockDown Browser.

When taking an online exam that requires LockDown Browser and a webcam, remember the following guidelines:

Ensure you're in a location where you won't be interrupted.

Turn off all other devices (e.g. tablets, phones, second computers) and place them outside of your reach.

Clear your desk of all external materials not permitted — books, papers, phones, other devices.

Before starting the test, know how much time is available for it, and that you've allotted sufficient time to complete it.

Remain at your computer for the duration of the test. Make sure that your computer is plugged into a power source, or that battery is fully-charged.

If the computer or networking environment is different than what was used previously with the Webcam Check and System & Network Check in LockDown Browser, run the checks again prior to starting the test.

To produce a good webcam video, do the following:

Do not wear a baseball cap or hat with a brim that obscures your face.

Ensure your computer or tablet is on a firm surface (a desk or table). Do NOT have the computer on your lap, a bed, or any other surface where the device (or you) are likely to move.

If using a built-in (internal) webcam, avoid tilting the screen after the webcam setup is complete.

Take the exam in a well-lit room and avoid backlighting, such as sitting with your back to a window.

Remember that LockDown Browser will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted.

