

George Mason University
College of Education and Human Development
Kinesiology

KINE 310_001 — Exercise Physiology I
3 Credits, Spring 2021

Mondays & Wednesdays 1:30pm – 2:45pm KJH 248 – SciTech Campus

Faculty

Name: Dr. Debra Stroiney

Office hours: M & W 12-1pm or by appointment

Office location: 201D Bull Run Hall

Office phone: 703-993-7075

Email address: dstroine@gmu.edu

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.

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
	DOMAIN 1: HEALTH & FITNESS ASSESSMENT 2. Determine and administer physical fitness assessments for apparently healthy clients and those with controlled disease.	
a)	Knowledge of the physiological basis of the components of health-related physical fitness (cardiorespiratory fitness, muscular strength, muscular endurance, flexibility, body composition).	Lecture
	DOMAIN I: HEALTH AND FITNESS ASSESSMENT 3. Conduct and interpret cardiorespiratory fitness assessments	Lecture
h)	Knowledge of the anatomy and physiology of the cardiovascular and pulmonary systems.	Lecture
l)	Knowledge of oxygen consumption dynamics during exercise (e.g., heart rate, stroke volume, cardiac output, ventilation, ventilatory threshold).	Lecture
n)	Knowledge of cardiorespiratory responses to acute graded exercise of conditioned and unconditioned participants	Lecture
	DOMAIN II: EXERCISE PRESCRIPTION & IMPLEMENTATION 1) Determine safe and effective exercise programs to achieve desired outcomes and goals, and translate assessment results into appropriate exercise prescriptions.	Lecture
e)	Knowledge of the physiologic changes associated with an acute bout of exercise.	Lecture
f)	Knowledge of the physiologic adaptations following chronic exercise training.	Lecture
i)	Knowledge of the physiological principles related to warm-up and cool-down.	Lecture
k)	Knowledge the role of aerobic and anaerobic energy systems in the performance of various physical activities.	Lecture

	b. DOMAIN II: EXERCISE PRESCRIPTION AND IMPLEMENTATION 2) Implement cardiorespiratory exercise prescriptions for apparently healthy clients and those with controlled disease based on current health status, fitness goals and availability of time	
j)	Knowledge of the applications of anaerobic training principles.	Lecture
k)	Knowledge of the anatomy and physiology of the cardiovascular and pulmonary systems including the basic properties of cardiac muscle.	Lecture
l)	Knowledge of the basic principles of gas exchange	Lecture
	b. DOMAIN II: EXERCISE PRESCRIPTION AND IMPLEMENTATION 3) Implement exercise prescriptions for flexibility, muscular strength, muscular endurance, balance, agility, and reaction time for apparently healthy clients and those with controlled disease based on current health status, fitness goals and availability of time	Lecture
j)	Knowledge of acute and delayed onset muscle soreness (DOMS).	Lecture
k)	Knowledge of the anatomy and physiology of skeletal muscle fiber, the characteristics of fast-and slow-twitch muscle fibers, and the sliding filament theory of muscle contraction.	Lecture
l)	Knowledge of the stretch reflex, proprioceptors, golgi tendon organ (GTO), muscle spindles, and how they relate to flexibility.	Lecture
m)	Knowledge of muscle-related terminology including atrophy, hyperplasia, hypertrophy.	Lecture
o)	Knowledge of the physiology underlying plyometric training and common plyometric exercises (e.g., box jumps, leaps, bounds)	Lecture
	b. DOMAIN II: EXERCISE PRESCRIPTION AND IMPLEMENTATION 8) Modify exercise prescriptions based on various environmental conditions	
a)	Knowledge of the effects of various environmental conditions on the physiologic response to exercise (e.g., altitude, variable ambient temperatures, humidity, environmental pollution).	Lecture

c)	Knowledge of the role of acclimatization when exercising in various environmental conditions (e.g., altitude, variable ambient temperatures, humidity, pollution).	Lecture
d)	Knowledge of appropriate fluid intake during exercise in various environmental conditions (e.g., altitude, variable ambient temperatures, humidity, environmental pollution).	Lecture

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, hard copy).

Evaluation

Evaluation Type	Points	Total
Assignments (11)	25	275
Exams (4)	100	400
Group Project	100	100
		775

Description of Evaluation

Assignments: Assignments for each chapter will be assigned throughout the semester, and will pertain to the subject matter being covered. Details and due dates will be posted on Blackboard.

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.

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/> .

CLASS SCHEDULE

Date		Topic & potential in class assignments	
Jan	24	Syllabus & Intro	
Jan	26	Energy Systems	Ch. 2
Jan	31	Energy Systems & Exercise	
Feb	2	Energy Systems and Exercise	Assignment 1
Feb	7	Energy Expenditure & Fatigue	Ch. 5
Feb	9	Energy Expenditure & Fatigue	Assignment 2
Feb	14	Exam 1	
Feb	16	Nervous System and Exercise	
Feb	21	Nervous System and Exercise	Assignment 3
Feb	23	Skeletal Muscle	
Feb	28	Skeletal Muscle	Assignment 4
Mar	2	Adaptations to Resistance Training	Ch. 10
Mar	7	Adaptations to Resistance Training	Assignment 5
Mar	9	Exam 2	
Mar	14	<i>Spring Break</i>	
Mar	16	<i>Spring Break</i>	
Mar	21	Cardiovascular System & Exercise	Assignment 6
Mar	23	Cardiovascular Control During Exercise	
Mar	28	Respiratory System & Exercise	Assignment 7
Mar	30	Respiratory System & Exercise	

Apr	4	Cardiorespiratory responses to acute exercise	
Apr	6	Cardiorespiratory Responses to acute exercise	Assignment 8
Apr	11	Exam 3	
Apr	13	Adaptations to Aerobic & Anaerobic Training	Ch. 11
Apr	18	Adaptations to Aerobic & Anaerobic Training	Assignment 9
Apr	20	The Environment & Exercise: Heat & Cold	Ch. 12
Apr	25	The Environment & Exercise: Heat & Cold	Assignment 10
Apr	27	The Environment & Exercise: Altitude	Assignment 11
May	2	Group Presentations	
May	4	Group Presentations	

****Exam 4 will be held during our scheduled final exam time: Wednesday, May 11th ****

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