George Mason University
College of Education and Human Development
Kinesiology

KINE 400 (001) —Biomechanics
3 Credits, Spring 2020
M, W 1:30 – 2:45 PM, K. Johnson Hall 247 – SciTech Campus

Faculty

Name:	Dr. Oladipo Eddo
Office Hours:	By appointment
Office Location:	201B K. Johnson Hall
Office Phone:	703-993-7183
Email Address:	oeddo@gmu.edu

TA name:
TA email:

Prerequisites/Corequisites
C or higher in BIOL 124, BIOL 125, ATEP 300, KINE 360.

University Catalog Course Description
Focuses on kinetic and kinematic concepts and how they apply to the quantitative assessment of human movement. Analyzes human movement and the functional dynamics of tissue such as muscle or bone.

Course Delivery Method
The course is a mix of a lecture and discussion course. However, other approaches may be used to facilitate learning. This includes videos, demonstrations and in-class activities. Overall, this will be a highly interactive class and students will be encouraged to participate.

Learner Outcomes or Objectives
This course is designed to enable students to do the following:

1) Describe and define movements and fundamental biomechanical principles using scientific terminology.
2) Define, recognize, and apply concepts of both linear and angular kinematics and kinetics as they apply to the analysis of human movement.
3) Recognize the equipment and techniques used for the quantitative assessment of human movement.
4) Apply biomechanical principles to human movement situations including but not limited to performance, training, rehabilitation, and injury prevention.
5) Evaluate the mechanics of exercises and activities as they affect the human body.
6) Apply principles related to internal tissue loading to improving tissue structure and function, and to injury prevention.

Professional 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 SCIENCE	
1.1.4	Knowledge of the plane in which each movement action occurs and the responsible muscles.	Lecture
1.1.5	Knowledge of the interrelationships among center of gravity, base of support, balance, stability, posture, and proper spinal alignment.	Lecture
1.1.8	Knowledge of biomechanical principles that underlie performance of the following activities: walking, jogging, running, swimming, cycling, weight lifting, and carrying or moving objects.	Lecture
1.7.47	Ability to assess postural alignment and recommend appropriate exercise to meet individual needs and refer as necessary.	Lecture

Required Texts
McGinnis, Peter. Biomechanics of Sport and Exercise, 3rd Edition, Human Kinetics. Champaign, Illinois, 2013.

Supplementary materials
Supplementary materials will be used in class and posted on BlackBoard/MyMason Portal. Please print these materials and bring them to class so that you have access to them when needed.

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).

Students will be evaluated on content standards (knowledge gained) and performance (demonstration of the content). Content standards will be assessed via exams and laboratory assignments. Performance will be assessed through completion of class activities. Once your FINAL GRADE, at the end of the semester is posted on mymasonportal/blackboard, you will have 24 hours to inquire about it. After that period, your grade will be posted as final on Patriot Web.

Assignments		Points
#1	Exam I	15
#2	Exam II	15
#3	Final Exam	15

#4	HW	10
#5	Lab Reports	25
#6	Lab Exam	10
#7	Professionalism	10
TOTAL		100

Grading Scale

A	= 94 – 100	B+	= 87 – 89	C+	= 77 – 79	D	= 60 – 69
A-	= 90 – 93	B	= 84 – 86	C	= 74 – 76	F	= 0 – 59
		B-	= 80 – 83	C-	= 70 – 73		

Notes:
1) Although a B- is a satisfactory grade for a course, students must maintain a 3.00 average in their degree program and present a 3.00 GPA on the courses listed on the graduation application.
2) Any student asking for their grade to be rounded up, increased a letter grade, extra credit only for themselves at the end of the semester, etc. may have their final average reduced by up to 2 points at the discretion of the instructor.

Assignment Description

Assignments and Examinations

Exams and Final Exam *(Course objectives 1, 2, 3, 4 & 6)*

Each student will be required to complete two exams and a final exam. The final exam will be cumulative. The format for all exams will be multiple choice, true/false, short essays, and problem-solving questions. Examinations represent inquiries regarding student knowledge of fact regarding course content. Examinations demonstrate that the student can remember and apply facts as well as demonstrate a hierarchy of knowledge information.

EXAM REVIEWS

As time allows in class and depending on class progress in each unit, a review *may* be offered before each exam. At that time, students can ask any content question that they would like. Students are not required to participate in the review, and can participate or leave as they choose. If there are no questions related to the content of the unit, the review session will be ended. Whether or not a review is conducted in class depends of class progress through the material for each unit *and* class participation in previous reviews. If there is no time to have a formal review or, if review sessions are not being utilized, students will need to come to office hours to address any questions on class material.

Labs, Lab Reports and Lab Exam *(Course objectives 1, 2, 3, 4, 5 & 6)*

The intent of the laboratories is to show how the theory learned in class can be applied to a variety of common activities. The labs will require students to work in small groups. During the lab sessions, data will be collected and a simple analysis will be performed. The labs will include questions regarding the results and several discussion questions. Each group must hand in **1** formal lab report,

which will be due in class exactly **1** week after the lab is performed (aside from the introductory lab which will be due the next day). Lab reports must be typed and include a cover sheet. Only calculations or figures (not graphs) may be hand written. There will be 8 lab reports in total with each carrying the same weight towards the overall grade. The math review lab report will NOT count for your grade. There will be a lab exam at the end of the semester. The lab exam will cover content from all labs performed during the semester. Students should expect multiple choice, fill in the blank, and short answer questions as well as calculations from various labs.

Professionalism *(Course objectives 1, 2, 3, 4, 5 & 6)*

Students are expected to behave in a professional manner. Depending on the setting professionalism may look slightly different but generally consists of similar components. For undergraduate Kinesiology students in a classroom setting professionalism generally consists of the following components:

Attendance and Participation **(50% of Professionalism Grade)** – Show up on time to class, pay attention, and engage yourself in the lessons, discussions, class activities, etc. Demonstrate that you have an interest in the subject matter. Follow George Mason University policies for any missed classes. Arriving to class late or leaving early will be counted as an absence. Students are expected to show up prepared to class and participate during class activities. Students who know they will need to miss a class for a legitimate reason should contact the instructor before the class. Students who unexpectedly miss a class for an excused reason should contact the instructor within 24 hours of missing the class. 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.

Communication **(25% of Professionalism Grade)** – When communicating with the instructor and classmates, either face-to-face or via email, students should address the other person appropriately, use appropriate language and maintain a pleasant demeanor.

Technology Use During Class

As per GMU policy, all sound emitting technology is required to be turned off during the class meeting time. No sound emitting technology (e.g., cell phones, smart phones, iPads, Tablets, pagers, etc.) is allowed at any time during the class period. Students who are observed using any form of technology inappropriately (e.g., sending text messages from cell phones, visiting social networking sites from laptops, etc) will be dismissed from class for the day, counted as an absence, and not permitted to make up missed assignments. Additionally, no laptop computers (e.g., netbooks, notebooks, etc.) will be permitted for use during class time unless with permission from the instructor.

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. Assignments must be turned in at the beginning of class on the specified date due or **no credit will be given**.

Communication – When communicating with the instructor and classmates, either face-to-face or via email (see below), students should address the other person with respect, use appropriate language, and maintain a pleasant demeanor. Students who fail to do may be asked to leave class, and will receive a grade of zero for all assignments or activities missed during that class period.

E-mail Correspondence - Messages must be in a professional format and originate from a Mason address:

Dear Dr. Eddo *(Beginning salutation),*
I have a question regarding one of the assignments. *(Text body)*
Respectfully, *(Ending Salutation)*
Student's name *(Your name)*

Class schedule

Date	Topic	Readings/Assignments
1/22	Introduction to KINE 400 Lab 1 - Introductory Lab	Introductory Chapter
1/27	Linear Kinematics	Chapter 2
1/29	Linear Kinematics	Chapter 2 **Lab 1 Due**
2/3	Lab 2 – Linear Kinematics *Location: Meet in classroom*	Chapter 2
2/5	Projectile Motion	Chapter 2
2/10	Lab 3 – Projectile motion *Location: Meet in classroom*	Chapter 2 **Lab 2 Due**
2/12	Forces and Linear Kinetics	Chapter 1, 3 **HW 1 Due**
2/17*	Lab 4 – Ground reaction forces *Location: SMART Lab – 9438 Innovation Loop*	Chapter 1, 3 **Lab 3 Due**
2/19	Linear Kinetics, Fluid Mechanics & Work, Power, Energy	Chapter 4, 8
2/24*	Lab 5 - Work, Power & Energy	Chapter 4, 8

	Location: SMART Lab – 9438 Innovation Loop	**Lab 4 Due**
2/26	Exam 1 Review	
3/2	**Exam 1**	**HW 2 Due**
3/4	Angular Kinematics	Chapter 6 **Lab 5 Due**
3/9	**Spring Recess**	
3/11	**Spring Recess**	
3/16*	Lab 6 – Angular Kinematics *Location: TBD*	
3/18	Angular Kinematics / Angular Kinetics	Chapter 5, 7
3/23	Angular Kinetics	**Lab 6 Due**
3/25*	Lab 7 – COM and Angular Momentum *Location: SMART Lab – 9438 Innovation Loop*	Articles on Blackboard **HW 3 Due**
3/30	Angular Kinetics / Mechanical Properties of Biological Tissues	Chapter 9
4/1	Mechanical Properties of Biological Tissues	Chapter 9 **Lab 7 due**
4/6	Lab 8 –Mechanical Properties of Biological Tissues *Location: Meet in classroom*	Articles on Blackboard
4/8*	Lab 9 – Muscle Force Production Relationships *Location: SMART Lab – 9438 Innovation Loop*	
4/13	Review for Exam 2	**Lab 8 Due**
4/15	**Exam 2**	
4/20	Technology & Instrumentation	Chapter 16 **Lab 9 Due** **HW 4 Due**
4/22*	Lab 10 – EMG *Location: SMART Lab – 9438 Innovation Loop*	
4/27	Technology & Instrumentation	
4/29	Wrap-up & Final Review	**Lab 10 Due**
5/4	**Lab Exam**	

Final exam: 1:30PM on Wednesday, May 6th

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

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/

Student Acknowledgement of Syllabus

I, _____, by signing below, attest to the following:
(Print First and Last Name)

*I have read the course syllabus for KINE 400 in its entirety, and I understand the policies contained therein. This syllabus serves as a binding contract for KINE 400 between the instructor and me.
*I have a clear understanding of the due dates for assignments and examinations, and I accept responsibility for the material.
*I am aware that failure to submit assignments by the dates assigned will result in no points awarded as late work will not be accepted.
*I understand that if I am using emitting sound technology or personal computers I will be dismissed from class for the day, counted as an absence, and not permitted to make up missed assignments
*I understand the instructor reserves the right to alter the provided schedules as necessary and I am responsible for the assignments and examination dates for the most current version of the syllabus schedule.
*I accept responsibility for reading announcements that are sent to me via e-mail through BlackBoard/MyMason Portal; it is my responsibility to access my Blackboard/MyMason Portal e-mail for messages, or forward Blackboard/MyMason Portal e-mail as per the directions provided in the syllabus.
*Points cannot be earned in this class until you have signed and handed this form to the instructor.

_____ _____
(Signature) **(Date)**

(Student Copy: This copy should remain attached to your syllabus)

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*I accept responsibility for reading announcements that are sent to me via e-mail through BlackBoard/MyMason Portal; it is my responsibility to access my Blackboard/MyMason Portal e-mail for messages, or forward Blackboard/MyMason Portal e-mail as per the directions provided in the syllabus.
*Points cannot be earned in this class until you have signed and handed this form to the instructor.

_____ _____
(Signature) **(Date)**

(Instructor Copy: Submit to the instructor at the end of the first class meeting)