

**APK 6226
Biomechanics**

Instructor: **Chris J Hass, Ph.D.**
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Meeting Time(s): Monday Period 2-4
Meeting Place: FLG 225
Office Hours: I am happy to meet with you as much as you want by appointment

General Information

This syllabus is intended to give the student guidance in what may be covered during the semester and will be followed as closely as possible. However the professor reserves the right to modify, supplement and make changes as the course needs arise. This includes exam dates and lecture topics that may change depending on class progress.

Overview of Course:

This course will cover the application of the principles of kinematics and kinetics to the human body during movement with regard to injury prevention and performance enhancement.

The method of presentation will be through lectures, demonstrations, PowerPoint presentations, guest lectures, and lab experiences.

Course Objectives: At the end of the course, the student should:

Understand and be able to explain the principles and methods of mechanics related to the quantification of human motion.

Understand and be able to explain the biomechanics of tissue

Understand and be able to explain the basics of gait analysis and the related movements of the joints of the lower extremity.

Required Textbooks:

Nordin, M. & Frankel, V.H. (2012). Basic Biomechanics of the Musculoskeletal System (4th Edition). Baltimore, Maryland. Lippincot Williams & Wilkins.

Optional but Helpful Textbooks:

Research Methods in Biomechanics by Robertson et al. Human Kinetics

Biomechanical Basis of Human Movement by Hammil and Knutzen

Course Policies:

1. Each student is expected to read all text assignments, as well as, other assignments made in lab or in lectures
2. Performance on tests and assignments will be the only criterion used in grade calculation.
3. If you need help, see your instructor. Be prepared. Read assignments before attending lectures or labs.

NOTE: Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

Grade Evaluation:

Lecture Examinations: Exams will be given on the following dates:

1. Monday, October 19
2. Wednesday, December 13

All exams will be comprehensive and objective in nature and may include multiple choice, true/false, short answer, essay, and quantitative problem solving.

Lab reports:

Formal lab reports will be turned in the week following each lab exercise. More instructions will be provided during the lab exercises.

Thematic Poster & Presentation:

A poster will be created based on an approved (by your instructor) biomechanical research topic. The poster should include several references. In addition, a 5 minute presentation regarding the poster will be given to the class. More instructions will be provided in the second half of the semester.

Article Discussion:

Each student will act as a discussion leader at least once during the semester. This will involve being familiar with assigned research articles and guiding the class during a one hour question and answer session.

Grading

Grades will be earned as follows:

EXAM 1	30%
EXAM 2	30%
Lab Reports	15%
Thematic Poster	15%
Article Discussion	10%
Total	100%

Grades will be assigned based on the following scale:

A	93.00% - 100%
A-	90.00% - 92.99%
B+	87.00% - 89.99%
B	83.00% - 86.99%
B-	80.00% - 82.99%
C+	77.00% - 79.99%
C	73.00% - 76.99%
C-	70.00% - 72.99%
D+	67.00% - 69.99%
D	63.00% - 66.99%
D-	60.00% - 62.99%
E	less than 60.00%

Please see the undergraduate catalog web page for more information regarding current UF grading policies.

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

You must earn your grade! Grades will not be rounded!

Academic Honesty:

Cheating will not be tolerated in this course. All students are required to abide by the

Academic Honesty Guidelines and Honor Code, which have been accepted by the

University. Cheating is defined as the improper taking or tendering of any information or

material, which shall be used to determine academic credit. Violations of the Honor Code will be handled according to the guidelines set by Student Judicial Affairs.

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with me.

Class Policies and Important Information:

Recording lectures: Lectures may be recorded for the use of students in this class only. Permission must be obtained from the instructor prior to recording any class lectures.

Cell phones: please turn them off prior to coming to class

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Accommodations for students with disabilities

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester

Online course evaluation process

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies

APK 6226 - Course Outline

Week	Date	Topic	Text
1	August 21	Introduction, policies, historical overview	handouts
2	August 28	Linear Kinematics	handouts
3	September 4	Holiday	
4	September 11	Angular Kinematics	handouts
5	September 18	Center of Mass, Segmentation method (www.rimas.net), reaction board method (lab)	Chapter 18
6	September 25	Biomechanics of Gait	Chapter 1, Chapter 18
7	October 2	Two-dimensional kinematics lab (www.rimas.net)	Chapter 12, Chapter 13, Chapter 18
8	October 9	Inverse dynamics	
9	October 16	EXAM 1 Wednesday, October 10	
10	October 23	Linear Kinetics	Chapter 2, Chapter 3, Chapter 4
11	October 30	Mechanics of bone, ligaments, tendons, and cartilage	Chapter 3, Chapter 4
12	November 6	Mechanics of bone, ligaments, tendons, and cartilage	Chapter 8
13	November 13	Biomechanics of the hip	Chapter 8
14	November 20	Biomechanics of the knee	Chapter 7
15	November 27	Biomechanics of the foot/ankle	Chapter 9
16	December 4	Thematic poster session	
	December 13	Final Exam:	