

BIOMECHANICAL BASIS OF MOVEMENT

APK3220C ~ 3 CREDITS ~ SPRING 2021

INSTRUCTOR:

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OFFICE HOURS: (HELD VIRTUALL VIA ZOOM)

M Period 2 (8:30 - 9:20 AM)

T Period 6 (12:50 PM - 1:40 PM)

W Period 3 (9:35 - 10:30 AM)

Contact me via email for an appointment if necessary.

MEETING TIMES/LOCATION:

CLASS NUMBER: 10772 & 26097

PRIMARILY CLASSROOM/TRADITIONAL

(M - OFFICE HOURS), **W,F** | PERIOD 2 (8:30 AM - 9:20 AM)

PRIMARILY CLASSROOM/TRADITIONAL - ROOM: FLG 0260

FINAL EXAM: 4/30/2021 @ 12:30 PM - 2:30 PM

CLASS NUMBER: 10773 & 26098

PRIMARILY CLASSROOM/TRADITIONAL –

T | PERIOD 5 – (**11:45 AM -12:30**) 6 (12:50 - 1:40 PM OFFICE HOURS) & R |
PERIOD 6 (**12:50 PM - 1:40 PM**)

PRIMARILY CLASSROOM/TRADITIONAL – ROOM: FLG 0285

FINAL EXAM: 4/27/2021 @ 7:30 AM - 9:30 AM

COURSE DESCRIPTION: Fundamentals of kinematics and kinetics related to human movement. Basics of biomechanics applied to the concepts of injury prevention and performance improvement. Overview of various biomechanical data collection and analysis.

PREREQUISITE KNOWLEDGE AND SKILLS: junior or senior standing; (APK 2100C or BSCX094+L or BSCX086+L or PETX322+L or ZOO3733c) and MAC 1140 with minimum grades of C); or PHY 2048 or PHY 2053 with minimum grade of C

** Physics 1 concepts will be **very helpful** in this course. You can be successful in this course if you have not taken physics, but it will require significantly more effort to get comfortable with the physics concepts intrinsic to biomechanics.*

REQUIRED AND RECOMMENDED MATERIALS:

Required Textbook:

Basic Biomechanics by Susan Hall 8th Edition ISBN9781259913877

Required Software:

- Microsoft Word and Excel 2010 or later
- Muscles and Motion (online application – Login for you is provided)
- Imagej: free image analysis obtained at <https://imagej.nih.gov/ij/download.html>

COURSE FORMAT: Asynchronous prerecorded lectures and other module content will be posted Monday mornings 8:30 AM. Module quizzes and homeworks will be due Tuesday evenings 11:59 PM (a week and 2 days after **being posted**).

Sections will meet live for 2 session per week for lecture. These live sessions will occur in person for the Primarily Classroom section while Online sections attend them via Zoom meetings that may be access through the Canvas course shell

The remaining session for the week will be online open office hours for all sections held via Zoom again accessible through the Canvas course shell.

COURSE LEARNING OBJECTIVES:

1. Identify biomechanical principles/concepts and describe the impact of biomechanics research on daily life
2. Describe the basic technology behind biomechanical instrumentation with a focus on motion capture
3. Identify the planes of motion and axes of rotation involved in a given human movement pattern

4. Solve biomechanical problems related to exercise, sport, and health using calculations related to:
 - a. Linear and angular kinematic variables (including position, velocity, acceleration)
 - b. Linear and angular kinetic variables (including force, torque, momentum, impulse, work, power, and energy)
 - c. Estimating the center of mass position
 - d. Fluid mechanics
5. Describe how fluid forces influence human motion involving liquids and air
6. Explain the basic mechanical properties, interactions, and functions of bones, tendons, ligaments, muscle, joints, and cartilage

CLASS LEARNING ENVIRONMENT

It is important to the learning environment that you feel welcome and safe in this class; and that you are comfortable participating in class discussions and communicating with me on any issues related to the class. If your preferred name is not the name listed on the official UF roll, please let me know as soon as possible by e-mail or otherwise. I would like to acknowledge your preferred name, and pronouns that reflect your identity. Please let me know how you would like to be addressed in class, if your name and pronouns are not reflected by your UF-rostered name. I welcome you to the class and look forward to a rewarding learning adventure together.

You may also change your "Display Name" in Canvas. Canvas uses the "Display Name" as set in myUFL. The Display Name is what you want people to see in the UF Directory, such as "Ally" instead of "Allison." To update your display name, go to one.ufl.edu, click on the dropdown at the top right, and select "Directory Profile." Click "Edit" on the right of the name panel, uncheck "Use my legal name" under "Display Name," update how you wish your name to be displayed, and click "Submit" at the bottom. This change may take up to 24 hours to appear in Canvas. This does not change your legal name for official UF records. <https://elearning.ufl.edu/student-help-faqs/>

COURSE AND UNIVERSITY POLICIES:

ATTENDANCE POLICY:

Attendance is not an explicit component of your overall grade, but you will miss important content/examples in not attending live lectures.

You must take the exams during your scheduled class time during the week of the exam session.

PERSONAL CONDUCT POLICY: Students are expected to exhibit behaviors that reflect highly upon themselves and our University. 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 obliged to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult the instructor or TA in this class.

EXAM MAKE-UP POLICY:

A student experiencing an illness should visit the UF Student Health Care Center or their preferred healthcare provider to seek medical advice and obtain documentation. If you have an illness, family emergency or death, please contact the Dean of Students Office (www.dso.ufl.edu) and follow the DSO Care Team procedures for documentation and submission of a request for make-up assignment (<https://care.dso.ufl.edu/instructor-notifications/>). The DSO will contact the instructor. Do not provide any documentation to the instructor regarding illness or family emergency. This is your personal and protected information. The DSO is qualified to receive and verify the documents you provide. The instructor will follow the recommendations from the DSO.

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

ACCOMMODATING STUDENTS WITH DISABILITIES: Students requesting accommodation for disabilities must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

COURSE EVALUATIONS: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

COVID-RELATED FOR FACE TO FACE:

- We will have face-to-face instructional sessions to accomplish the student learning objectives of this course. In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom interactions.
- You are required to wear approved face coverings at all times during class and within buildings. Following and enforcing these policies and requirements are all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.
- This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations.
- Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
- Follow your instructor's guidance on how to enter and exit the classroom. Practice physical distancing to the extent possible when entering and exiting the classroom.
- If you are experiencing COVID-19 symptoms ([Click here for guidance from the CDC on symptoms of coronavirus](#)), please use the UF Health screening system and follow the instructions on whether you are able to attend class. [Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms](#).
- Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. [Find more information in the university attendance policies](#).

PRIVACY:

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

GETTING HELP:

Health and Wellness

- U Matter, We Care: If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575
- Counseling and Wellness Center: <https://counseling.ufl.edu/>, 352-392-1575
- Sexual Assault Recovery Services (SARS) - Student Health Care Center, 392-1161
- University Police Department, 392-1111 (or 9-1-1 for emergencies)
<http://www.police.ufl.edu/>

Academic Resources

- E-learning technical support, 352-392-4357 (select option on 2) or e-mail to Learning-support@ufl.edu. <https://lss.at.ufl.edu/help.shtml>
- Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling. <https://career.ufl.edu/>
- Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.
- Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <http://teachingcenter.ufl.edu/>
- Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <http://writing.ufl.edu/writing-studio/>
- Student Complaints On-Campus: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/> On-Line Students Complaints: <http://distance.ufl.edu/student-complaint-process/>

GRADING:

Table 1: Grade Point Category Breakdown

Evaluation Components (number of each)	Points Per Component	Approximate % of Total Grade
Lecture Exams (3)	120 pts each = 360 pts	360/1000 = 36 %
Comprehensive Final Exam (1)	160 pts each = 160	160/1000 = 16 %
Module Content Quizzes (13)	20 pts each = 260 pts	260/1000 = 26 %
Quantitative Homework (11)	20 pts each = 220 pts	220/1000 = 22 %
Total	1000	100 %

Assessment Proctoring Via Honorlock

Honorlock will proctor your exams this semester. Honorlock is an online proctoring service that allows you to take your exam from the comfort of your home. You DO NOT need to create an account, download software or schedule an appointment in advance. Honorlock is available 24/7 and all that is needed is a computer, a working webcam, and a stable Internet connection.

To get started, you will need Google Chrome and to download the Honorlock Chrome Extension. You can download the extension at www.honorlock.com/extension/install

When you are ready to test, log into Canvas, go to your course, and click on your exam. Clicking "Launch Proctoring" will begin the Honorlock authentication process, where you will take a picture of yourself, show your ID, and complete a scan of your room. Honorlock will be recording your exam session by webcam as well as recording your screen. Honorlock also has an integrity algorithm that can detect search-engine use, so please do not attempt to search for answers, even if it's on a secondary device. Good luck! Honorlock support is available 24/7/365. If you encounter any issues, you may contact them by live chat, phone (855-828-4004), and/or email (support@honorlock.com).

Exams For Online Sections AND Face to Face Sections: Lecture exams will be timed Honorlock proctored Canvas quizzes scheduled during your assigned section time.

Lecture Exams (3): Exams may consist of multiple-choice, true-false, short answer and free response problem solving questions. Students are not permitted access to any kind of materials or notes during these exams. Exam questions are generated by the course instructor and the majority of focus should be given to the lecture notes and problem sets when studying although supplementary readings/resources will also be helpful. Students will take exams in the same room where weekly meetings are held and will be allowed 50 minutes to complete the exam. A **SCIENTIFIC** calculator will be permitted during exams and quizzes. A formula sheet will be provided.

Quantitative Homework: These homework assignments will be assessed via a Canvas Quiz submission, but the assignments will be given to you before to work through at your leisure. These homework assignments will contain problems regarding the current week's topics in the content lectures and may also include movement analysis of one or more the movements/poses for the week using imagej and provided images.

Module Quizzes: Module quizzes based on lecture content and Muscles and Motion videos listed for the week. These are individual (i.e. not group) quizzes. Although typically you will not have questions beforehand the quizzes are open notes/book/videos and will have a relatively relaxed time constraint.

Final Exam: The final exam is a comprehensive for the semester. It will be longer than the individual lecture exams and will be scheduled during your sections assigned timeslot during finals week. This exam will be in the same style as the preceding 3 lecture exams but cover content from across the semester.

GRADING SCALE: Grades will be based on a point system of 1000 total points coming from quizzes, exams, and assignments.

Once a grade is posted students have **two weeks** to dispute an error in grading.

More information about UF's grading policies may be found here:

<https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>.

Any requests for additional extra credit or special exceptions to these grading policies will be interpreted as an honor code violation (i.e., asking for preferential treatment) and will be handled accordingly.

Letter Grade	Percent of Total Points Associated with Each Letter Grade	GPA Impact of Each Letter Grade
A	90.00-100%	4.0
B+	87.00-89.99%	3.33
B	83.00-86.99%	3.0
B-	80.00-82.99%	2.67
C+	77.00-79.99%	2.33
C	73.00-76.99%	2.0
C-	70.00-72.99%	1.67
D+	67.00-69.99%	1.33
D	60.00-66.99%	1.0
E	0-59.99%	0

WEEKLY COURSE SCHEDULE:

Week	Dates	Module
1	Jan 11 - Jan 15	Introduction to Biomechanics
2	Jan 18 - Jan 22	Monday Jan 18 Holiday Fundamental Tools and Concepts
3	Jan 25 - Jan 29	Biomechanical Instrumentation
4	Feb 1 - Feb 5	Muscle Biomechanics
5	Feb 8 - Feb 12	Exam 1 (T/W) Tissue Loading
6	Feb 15 - Feb 19	Hip Complex Biomechanics
7	Feb 22 - Feb 26	Knee Complex Biomechanics
8	Mar 1 - Mar 5	Ankle and Foot Complex Biomechanics
9	Mar 8 - Mar 12	Exam 2 (R/F)
10	Mar 15 - Mar 19	Linear Kinematics
11	Mar 22 - Mar 26	Angular Kinematics
12	Mar 29 - Apr 2	Linear Kinetics
13	Apr 5 - Apr 9	Equilibrium

14	Apr 12 - Apr 16	Angular Kinetics
15	Apr 19 - Apr 23	Exam 3 (T/W) Thurs and Friday are Reading Days
16	Apr 26 - Apr 30	APK 3220C – Section 10773 & 26098 - Final Exam: 4/27/2021 @ 7:30 AM - 9:30 AM APK 3220C – Section 10772 & 26097 - Final Exam: 4/30/2021 @ 12:30 PM - 2:30 PM

This syllabus and schedule are 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.