

APK 6225
Biomechanical Instrumentation
Spring 2021

Instructors	Email	Office	Phone
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Office Hours: By Appointment

Class Room: FLG 0210
Class Days: Thursday
Class Time: Period 6-8 (12:50 pm - 3:50 pm)
Class #: 10798

Course Overview

The overarching goal of this course is to develop students' knowledge and appreciation of the instrumentation used to evaluate human motor function. We will provide a general overview of data collection techniques in biomechanics, electrophysiology of muscle and brain, and functional imaging related research. Additionally, hands on experience will be gained through laboratory experiences using motion capture, EMG, transcranial magnetic stimulation, force transducers, functional MRI, and electroencephalography. The course is broken into modules for each of the techniques in the course.

Textbook

To achieve the above course objectives, the following textbooks are recommended but not required **Research Methods in Biomechanics (Robertson et al)**, **Functional Magnetic Resonance Imaging (Huettel et al.)**, and **Niedermeyer's Electroencephalography (Schommer)**. Occasionally, handouts, readings, or other notes will be made available in class or on web. You should have a classmate collect handouts in your absence. Journal articles will be placed on Canvas.

General Course Policies

Attendance: Make every effort to attend all lectures. Attendance and participation is 10% of your grade. Each unexcused absence will result in 3% drop.

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

Accommodations: Students requesting classroom or other special accommodations must first register with the Dean of Students Office—Disability Resource Center (DRC).

The Dean of Students Office will provide documentation to the student who must then present the documentation to the instructor when requesting accommodation. For

optimal consideration, you must see the professor within the first three days of class.

Technology: The use of cell phones* (and the like) is strictly prohibited during lectures and exams. Any cell phone or other electronic device used during an exam will be considered a violation of the student honor code (i.e., cheating) and will result in stiff penalties. Laptop computers are welcome in class as long as you are using it for class-related work. Surfing the web, checking your email, making Facebook posts, or anything of that nature is strictly prohibited. Violation of this policy will result in point deductions at the discretion of the instructor.

Communication: You are responsible for checking announcements and course postings on E LEARNING. This is how your course instructor will communicate with you. All course grades will be posted on E LEARNING. Any discrepancies should be pointed out to the instructor on or before the last day of finals week.

Academic Honesty: 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."*** Any student found violating this honor code will receive a zero for that exam or assignment and may be assigned other educational sanctions at the instructor's discretion.

<https://sccr.dso.ufl.edu/process/student-conduct-code/>

Evaluations: Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online 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 the assessments will also be available to students at website.

Counseling and Wellness Center:

<http://www.counseling.ufl.edu>

392-1575

University Police Department: 392-1111 or 9-1-1 for emergencies

COVID-RELATED: 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 unmute 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.

Student Learning Objectives

Upon completion of this course, the student will be able to:

1. Knowledge: Discuss, explain, and defend subject matter relevant to neuromuscular physiology
2. Skills: Discuss, explain, and compare specific skills related to neuromuscular physiology
3. Professionalism: Present and explain vital, relevant concepts in neuromuscular physiology in a professional manner

Course Examinations and Grading

Activity/Assignment	Points
1. Final Exam	40
2. Laboratory Exercises (x4)	50
3. Attendance and participation	10
TOTAL POINTS	100

Course Format

The class will occur in modules. Each module will include lecture, hands-on use of the specific technique, analysis by the students, and written summary of the module experiment. The students will work in group projects during the course.

Evaluation

1. One Final Exam (40% of final grade)
2. Five Laboratory exercises (50%)
3. Attendance and participation (10%)

Class Participation – All students who arrive on time will begin with 10 points. The following list outlines behaviors that will result in point deductions.

- Routine Lateness -1 pt for every 5 minutes late
- Lack of professionalism (on phone, interruptions, sleeping, etc.) -1 pt
- Not participating (avoiding discussions, not asking questions) -1 pt .

Any participation deductions will be communicated directly to the student at the time of the deduction or will be noted in the gradebook. If a student's lack of participation is causing a distraction or a disturbance to the overall flow or good energy of the class, the instructor will ask the student to leave, resulting in zero participation points and a written warning. Should that happen more than once, the student will receive a letter grade penalty and their advisor will be notified.

The instructor will discuss a student's grade with him or her, however: (a) grade discussion will occur during office consultation and will not occur via email, and (b) a student's grade will not be changed on any assignment, nor will his or her final grade be adjusted unless justifiably warranted (i.e., error in grading). Students are allowed **one week** from the receipt of their graded work to notify the instructor of any errors or dispute evaluation. Grade adjustments (e.g., poorly worded item on an exam, extra-credit) will occur at the instructor's discretion.

Examinations

If the student absolutely cannot be in class when an exam is scheduled, it is the student's responsibility to contact the instructor **at least 2 weeks prior to the scheduled exam**, with valid documentation for missing the exam, to arrange a time to take it before the scheduled exam date (note: rescheduled exams may be different from the exams given during the regularly-scheduled exam period). If the student is missing a scheduled exam due to a university-scheduled event, the student must provide the instructor with documentation from a university faculty or staff member (i.e., written documentation on university letterhead signed by the faculty/staff member) **2 weeks prior to the exam**.

Exam Makeup Policy: Make-up exams will be given at the discretion of the instructor. Documentation will be required. Unexcused missed exams will result in a zero on the exam (this includes contacting the instructor after the exam if you are ill). You are absolutely not permitted a make-up exam for personal travel/vacations, so please make your travel arrangements accordingly. If you have a serious emergency or life event, please contact the Dean of Students Office (www.dso.ufl.edu) and they will contact your instructor so that you do not have to provide documentation of the emergency/death in order to get a make-up exam.

Grades: The total points earned from the exam, lab assignments, and participation will be summed. There is no curve for this course. I reserve the right to round up grades for students who show exceptional participation in class. However, under most circumstances **GRADES WILL NOT BE ROUNDED UP!!!** If you earn a 79.94%, you will receive a C+, not a B. The following grading scale will be used to assess students in this course. For more detailed information on current UF grading policies, please see the undergraduate catalog web page:

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

Letter Grade	Points Necessary for Each Letter Grade	Percent of Total Points	GPA Equivalent
A	93	93.00-100%	4.0
A-	90	90.00-92.99%	3.67
B+	87	87.00-89.99%	3.33
B	83	83.00-86.99%	3.0
B-	80	80.00-82.99%	2.67
C+	77	77.00-79.99%	2.33
C	70	70.00-76.99%	2.0
D+	67	67.00-69.99%	1.33
D	60	60.00-66.99%	1.0
E	<60	0-59.99%	0

Tentative Lecture Schedule

This approximates what the semester will consist of. This outline is subject to change at any point during the semester.

DATE	TOPIC	ASSIGNMENT
Jan 14 – Christou	EMG	
Jan 21 – Christou	EMG	
Jan 28 – Christou	EMG	
Feb 4 - Terza	MOTION CAPTURE	EMG Assignment Due
Feb 11 - Terza	MOTION CAPTURE	
Feb 18 - Terza	MOTION CAPTURE	
Feb 25 - Seidler	TMS	Motion Capture Assignment due
Mar 4 – Seidler	TMS	
Mar 11 – Seidler	TMS	
Mar 18 – Vaillancourt	EEG	TMS Assignment due
Mar 25 – Vaillancourt	EEG	
Apr 1 – Vaillancourt	EEG	
Apr 8 – Coombes	MRI	EEG Assignment due
Apr 15 – Coombes	MRI	
April 26 7:30-9:30	FINAL EXAM	MRI Assignment due – April 22