

APK 6225
Biomechanical Instrumentation
Spring 2020

Instructors	Email	Office	Phone
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Office Hours: By Appointment

Class Room: FLG 0235
Class Days: Thursday
Class Time: Period 6-8 (12:50 pm - 3:50 pm)
Class #: 10742

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, force transducers, functional MRI, electroencephalography, and eye tracking. 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. Although attendance will not affect your grades directly, it could influence them indirectly. Numerous concepts that will be discussed only during class (and are not in the book) will be part of your weekly quizzes. <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Make-up quizzes: Unexcused absences on quiz days will result in a zero on the quiz. If you are ill or have an emergency that prevents you from taking the quiz at the scheduled time, it is your responsibility to contact the instructor as soon as possible. There will be no make-up quizzes. Instead, in case of an excused absence, the following quiz will

count twice (after the 3 allowed to be dropped). Documentation of the illness or emergency will be required.

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

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	50
2. Laboratory Exercises (x4)	40
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 (50% of final grade)
2. Four Laboratory exercises (40%)
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 quizzes and presentation 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 9 Christou	Introduction and Expectations	
JAN 16 Christou	Electromyography Lecture	
JAN 23 Christou	EMG Data Collection Examples	
JAN 30 Christou	EMG Data Analysis	
FEB 6 Terza	Motion Capture Lecture	EMG Assignment Due
Feb 13 Terza	Motion Capture Data Collection	
Feb 20 Terza	Motion Capture Data Analysis	
FEB 27 Seidler	TMS Lecture	Motion Capture Assignment due
SPRING BREAK		
March 12 Seidler	TMS Data Collection	
March 19 Seidler	TMS Data Analysis	
March 26 Coombes	Functional MRI Lecture	TMS Assignment Due
April 2 Coombes	Functional MRI Data Collection	
April 9 Coombes	Functional MRI Analysis	
APRIL 16 Janelle/Beatty	Eye Tracking	fMRI Assignment Due
Final Exam April 27 7:30-9:30		