

APK 6225 Biomechanical Instrumentation

Class meeting:

Thursday, Period 6-8 (12:50-3:50), TUR2334

Contact information:

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Course Objectives

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.

Course Materials

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.

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.

Grade Scale:

93.0% - 100% = A
90.0% - 92.9% = A-
87.0% - 89.99% = B+
83.0% - 86.99% = B
80.0% - 82.99% = B-
77.0% - 79.99% = C+
73.0% - 77.99% = C
70.0% - 72.99% = C-
67.0% - 69.99% = D+
63.0% - 66.99% = D
60.0% - 62.99% = D-
<60 = E

Information on current UF grading policies for assigning grade points:

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

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.

Requirements for class attendance and make-up exams, assignments, and other work are consistent with the university policies that can be found at

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

Academic Honesty: 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-honorcode/>) 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 as soon as possible.

Accommodations for students with disabilities

Students with disabilities requesting accommodations should first register with the DisabilityResource 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/>.

Additional Resources:

Health and Wellness

- U Matter, We Care: If you or a friend is in distress, please contact umatter@ufl.edu or 352 392- 1575 so that a team member can reach out to the student.
- Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc/Default.aspx>, 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 2) or e-mail to Learningsupport@ufl.edu. <https://lss.at.ufl.edu/help.shtml>.
- Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <http://www.crc.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 Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf On-Line

Students Complaints: <http://www.distance.ufl.edu/student-complaintprocess>

TENTATIVE SCHEDULE

DATE	TOPIC	ASSIGNMENT
JAN 11 Hass/Vaillancourt	Introduction and Expectations for course	
JAN 18 Vaillancourt	Electroencephalography Lecture	
JAN 25 Vaillancourt	Electroencephalography Lecture Data Collection Examples	
Feb 1 Vaillancourt	Electroencephalography Data Collection/Analysis	
FEB 8 Hass	Motion Capture Lecture	EEG Assignment Due
Feb 15 Hass	Motion Capture Data Collection Examples	
Feb 22 Hass	Motion Capture Data Collection/Analysis	
March 1 Christou	Intramuscular and Surface Electromyography Lecture	Motion Capture Assignment due
SPRING BREAK		
March 15 Christou	Surface Electromyography Data Collection Examples	
March 22 Christou	Surface Electromyography Data Collection/Analysis	
March 29 Coombes	Functional MRI Lecture	EMG Assignment Due
April 5 Coombes	Functional MRI Data Collection Examples	
April 12 Coombes	Functional MRI Data Collection/Analysis	
APRIL 19 Janelle/Beatty	Eye Tracking	fMRI Assignment Due
Final Exam		