

**EEE 4260C Bioelectrical Systems**  
**Section 2A72, 22D1**  
**Spring 2019**

	<b>Class</b>	<b>Lab</b>
<b>Periods</b>	M Period 9 (4:05-4:55 pm)	T Period 11-E1 (06:15pm - 08:10pm)
	W Period 9 (4:05-4:55 pm)	W Period E2-E3 (8:20pm-10:10pm)
	F Period 9 (4:05-4:55 pm)	F Period 5-6 (11:45am - 01:40pm)
<b>Location</b>	ROG 0110	NEB 213B

**1. Instructors** – Dr. Erin Patrick and May Mansy

- a. Office location: 206 NRF (Patrick), 485 NEB (Mansy)
- b. E-mail address: erin.patrick@ece.ufl.edu, maymansy@ufl.edu
- c. Class Web site: TBD
- d. Office hours: TBD

**2. Teaching Assistant** – Rebeca Castro and Marquita Scott

- a. Office location: NEB 213B
- b. E-mail address: rcastro4@ufl.edu, scottm2@ufl.edu
- c. Office hours: TBD

**3. Catalog Description**– (4credits) This course covers the theoretical and quantitative perspective of bioelectrical signals reflecting the activity of the brain, the muscles, and the heart. Bases of modeling, measuring, processing and analyzing bioelectrical signals are discussed, as well as common clinical applications.

**4. Pre-requisites**– EEL 3008 or permission from the instructor

**5. Course Objectives**– The student will learn the physiological basis of bioelectrical signals; will be able to quantitatively describe and model physiologic systems; and will be able to process and analyze measurements from living systems.

**Lab Objectives:**

- Illustrate, instantiate, extend material covered in lecture
- Teach practical hands-on skills/knowledge
- Stimulate interest/satisfy curiosity in the course
- Teach experimental methods

**6. Class/laboratory schedule**- 3 class periods each week consisting of 50 minutes each and 1 laboratory period every two weeks consisting of 150 minutes.

**7. Material and Supply Fees**- \$40.00

## 8. Textbooks and Software Required –

Free e-book access at UF Library

a. Title: Bioelectricity: A Quantitative Approach, by R. Plonsey and R. Barr, 3rd Edition, ISBN number: 0387488642

b. Software: Matlab with Simulink Student Edition

9. **Recommended Reading**– Supplemental material to be assigned and provided via course website

## 10. Course Outline –

Week	Date	Lecture Topics	Lab	Homework
1	1/6	Class Introduction, vector calculus review, introduction to neurophysiology		--
2	1/13	Sources, fields and bioelectric potentials	L0: Orientation	HW1 due
3	1/23	Ion channels, membrane biophysics and Hodgkin-Huxley model		HW2 due
4	1/27	Membrane equilibrium and Action potentials	L1: Body Temperature	HW3 due
5	2/4	Action potential recording		HW4 due
6	2/11	Action potential simulation and <b>Test #1</b>	L2: Spikes	--
7	2/18	Action potential propagation		HW5 due
8	2/25	Electrical stimulation		HW6 due
9	3/4	<b>SPRING BREAK</b>		--
10	3/11	Extracellular field recording		HW7 due
11	3/18	Electroencephalography	L3: EEG waves & power bands	HW8 due
12	3/25	Electrocardiography and <b>Test #2</b>		--
13	4/1	Cardiac biophysics and cell model	L4: ECG & heart rate monitoring	HW9 due
14	4/8	Neuromuscular junction and functional electrical stimulation		HW10 due
15	4/15	Biophysics of skeletal muscle	L5: EMG Acquisition and Display & Agonist and antagonist muscles	HW11 due
16	4/21	Neural Network dynamics		HW12 due
17	4/28	Review and <b>Final Exam</b>		

11. **Attendance and Expectations** - Attendance is required for all lectures unless otherwise noted by a course website announcement.

YOU ARE EXPECTED TO ATTEND > 85% OF THE LECTURES TO EARN 5% TOWARDS YOUR FINAL GRADE

- Cell phones and other electronic devices are to be silenced
- No text messaging during class or exams

- 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>

#### 14. Grading

Homework -15%  
Attendance -5% (only if >85% of the lectures was attended)  
Midterm1 -15% (in class 2/13/19)  
Midterm 2 -15% (in class 3/27/19)  
Lab -25%  
Final exam -25% 5/2/2019 (5:30 - 7:30 pm)

Students are permitted to work together on homework, but the work submitted must be individual work.

15. **Grading scale-** This class uses the +/- grading scale.

16. **Homework and Make-Up Exam Policy**—Late homework will receive 20% deducted per day for **two** days after due-date unless prior arrangements were made with the instructor.

If you have a University-approved excuse and arrange for it in advance, or in case of documented emergency, a make-up exam will be allowed, and arrangements can be made for making up missed work.

University attendance policies can be found at:

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

Otherwise, make-up exams will be considered only in extraordinary cases, and must be taken before the scheduled exam. The student must submit a written petition to the instructor two weeks prior to the scheduled exam and the instructor must approve the petition.

17. **Honesty Policy**— 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/scer/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 the instructor or TAs in this class.

18. **Accommodation for Students with Disabilities**— Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://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.

19. **Software Use**– All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

20. **Course Evaluation** – 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 these assessments are available to students at: <https://evaluations.ufl.edu/results> .