

BME 6938 Engineering Applications in Musculoskeletal Pain Spring, 2023

Catalog Description:

Special Topics in Biomedical Engineering

Credits: 03

Proposed Catalog Description:

Special Topics in Biomedical Engineering do not have official catalog descriptions, as these courses are in development. Below is the proposed description:

This course covers biological, psychological, and social aspects of pain from the peripheral sensing of painful inputs through to the central processing of these inputs. The course will cover the fundamentals of pain processing, review current literature on pain science, and conduct practicums in methods used to assess pain in humans and in animals.

Credits: 03

Prerequisites and Expectations:

Students must be enrolled in the BME graduate program and have fulfilled the BME graduate program requirements for physiology

Course Information:

Instructor: Kyle D. Allen, Ph.D.

Office: BMS J389

Office Hours: By appointment; see grading section

Email: kyle.allen@bme.ufl.edu

Notes: All discussions related to grades and re-grade requests will be exclusively handled through CANVAS; this creates a log of the request such that it is tracked using a FERPA compliant and UF approved system.

Substitute Instructor: Yenisel Cruz-Almeida, Ph.D.

Email: cryeni@ufl.edu

Note: Dr. Cruz-Almeida is a leading pain research expert and will be assisting with the class on an as needed basis. In particular, Dr. Cruz-Almeida will assist with the central processing section of the course.

Class Meeting:

- Monday, Wednesday, Friday, Period 3 (9:35 AM – 10:25 AM)

Required Textbook, Documentation and Software (free, but required):

- None

Resources and Recommended Texts (not necessarily free, but not required):

- Wall and Melzack's Textbook of Pain; available in the library. Chapters will be posted on CANVAS as necessary.

Important Teaching Philosophy Note:

The intent of this class is to provide basic pain background, review current pain literature, and to be exposed to the methods used to assess pain in humans and patients. Through the first few weeks, we will focus on fundamental pain signaling, but later in the class, we will be interacting and interviewing pain researchers to learn more about their approaches and methods. As engineers, we will focus on ideation and improving measures, when possible. To do this, I expect an open dialogue, sharing of ideas, brainstorming, and lots of discussion. Participation will be a major part of this course.

Format and Grade Determination:

This class is intended to be a “practicum”, which means participation in the practice will be a critical component.

Grade Breakdown

25% Quizzes

25% Journal Club Reviews

25% Assistance with the Practicums

25% Practicum Products

Quizzes: Quizzes are intended to test basic, fundamental concepts in the course. These assessments will be given periodically to assure students are learning the fundamentals of pain processing. Quizzes will be on Canvas, with points totaled across all quizzes. For example, quiz #1 may be one question worth one point; whereas quiz #2 may be five questions worth five points. The student score will be calculated on a point basis first and percentage second. So, a score of Quiz 1: 0/1 and Quiz 2: 5/5 would yield 5/6 for 83.3%. In this way, quizzes are weighted based on their point total.

Journal Club Reviews: Periodically, one or two reflection questions will be provided for the journal articles reviewed in class. Depending on the assessment, these may be due before or after the class. Reflections are expected to be short answers of around 500 words; word counts are not strictly enforced, but over-answering a question can negatively affect your point total for some activities – this is noted on those assessments.

Assistance with Practicums: During the semester, you will assist Dr. Allen with setting up a practicum for different pain assessment methods. During this time, you will come to one or two of Dr. Allen’s office hours – which he will flex with your and his schedule – to discuss ideas and logistics. Upon completion of the practicum, you will also provide a review, discuss findings (if any), assess your teammates, and provide suggestion on what could be improved in the future.

Projects: If you are not setting up a practicum, you will be participating in a practicum. As a participant, you will be asked to produce some “products” related to the practicum, which may include brainstorming ideas, data, or other documents.

Grading Scale

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
90.0-100	87.0-89.9	84.0-86.9	81.0-83.9	78.0-80.9	75.0-77.9	72.0-74.9	69.0-71.9	66.0-68.9	63.0-65.9	60.0-62.9	0-59.9

We will round your grade to the nearest tenth of a point; then, your letter grade will be assigned based on the above table. Grades are not curved, however, if the majority of the class is unable to answer a question, we may consider make-up problems that augment the scores on an assignment. To assure fairness, make-up problems are issued to the entire class - not to individuals.

Course Policies:

Policy on Working Together and Group Work:

Peer-to-peer learning enhances learning; thus, students are highly encouraged to ask general questions both in class. Moreover, this course is team science based, and your ability to work in groups will be assessed as part of the practicum development and practicum products. Inability to work affectively in a team can negatively affect your scores in these sections. Teamwork will be assessed by instructor observation and team assessments.

Policy on Attendance

I expect students to attend the class regularly. However, attendance in class is not strictly required for full credit. Absences do need to be excused by the professors - please ask. I understand that, in this environment, you may have additional constraints to manage – experiments, conferences, etc. I will work with you to the best of my ability, but I also need to respect the training that we, as faculty, have been tasked to provide to the students in our department and college. As such, I expect students to be in class, ready to learn, engaged, and overall contributors to the learning environment. This is clearly not possible if you cannot regularly attend class.

I will maintain a zoom link for students that have been excused from class. Unexcused absences will not be admitted to the zoom room. *If you are sick, please stay home and plan to attend via zoom if possible.* If you are traveling for a conference, you may also attend via zoom if you are able to, though this is not expected. If you are able to be in class, you should be in class.

Policy on the Course Evaluation

Part of our job as instructors is to constructively evaluate you as a student. Part of your job as a student is to constructively evaluate us as instructors. The only metric we can see before grades are due is percentage of the students that evaluated the course—we cannot see scores, comments, or any other content until grades are submitted. Thus, you should write your honest, constructive opinion of the course. I do value this feedback and this feedback is used by our department, college, and university.

Policy on Late Coursework

Unless *prior arrangements* have been made with an instructor, students will be deducted 15% per day (24h) for late coursework, with deductions occurring at the time associated with the due date. E.g., 24.001 hours after the due date and time results in a 30% (3 letter grade) reduction.

Policy on Grade Corrections

Students have 1 week after receiving a grade to challenge errors or grading mistakes. 1 week after students have been informed of their grade, the grade will become final and will not be changed. Do not wait for the end of the semester; we will not adjust your grade for assignments that are beyond this deadline.

To challenge a grade: Students must attach a cover page and write up of why the re-grade is being request, explaining what they want to be re-graded and why they think the grade is incorrect. We do occasionally make mistakes, but re-grades will not be issued following verbal debates over grades. We can discuss the problems, our solutions, and the key, but I will only regrade when we have adequate time, space, and focus to assess the issue in order to be equitable across all students. *This policy is strictly enforced—no exceptions.*

Policy on Course Recordings

For online content and recorded materials, I retain the copyright of this material. It is yours to use for your own personal education, but it may not be redistributed to others without my consent.

A statement informing students of privacy related issues for online zoom rooms is as follows:

Our in-class and zoom sessions may be audio visually recorded. 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.

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

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/>.

University 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 (<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-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.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students 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.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the [Office of Title IX Compliance](mailto:title-ix@ufl.edu), located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://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.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: <https://care.dso.ufl.edu>.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.