# Biomaterials Lab

EMA 4061L Section 13732
***Class Periods:*** N/A
***Location:*** N/A
***Academic Term:*** Fall 2020

***Instructor:***
Josephine Allen, Ph.D.
jallen@mse.ufl.edu
Office Hours: By appointment

***Teaching Assistant/Peer Mentor/Supervised Teaching Student:***
Please contact through the Canvas website

- Heather Ursino, heather.ursino@ufl.edu, office hours by appointment

***Course Description***
Hands-on laboratory experience in the processing and characterization of biomaterials for use in medical applications. (1 credit hours)

***Course Pre-Requisites / Co-Requisites***
Co-requisite EMA4061

***Course Objectives***
The objective of this course is for students to become familiar with biomedical engineering experimental techniques and methods used to evaluate biomaterials for medical applications. Students will gain knowledge and learn advanced principles that are involved at the interface between a biomaterial and the living system. Student will review and design experiments as well as analyze and interpret data.

***Materials and Supply Fees***
TBD

***Professional Component (ABET):***
1 credit of Engineering Topics

***Relation to Program Outcomes (ABET):***
The table below is an example. Please consult with your department's ABET coordinator when filling this out.

| Outcome | Coverage* |
|---|---|
| 1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics | Medium |
| 2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors | Medium |
| 3. An ability to communicate effectively with a range of audiences | Medium |
| 4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts | Low |

| | |
|---|---|
| 5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives | Low |
| 6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions | High |
| 7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies | Medium |

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

***Required Textbooks and Software***

No required textbook. Course material will be provided by the instructor.

***Recommended Materials***

Other reference material (i.e. literature manuscripts, video lab demonstrations etc.) will be used throughout the class. These will be indicated by the instructor and provided as used or needed.

***Course Schedule (Tentative)***

Week 1: Module 1: Introduction
Week 2: Module 2: Laboratory Safety
Week 3-4: Module 3: Biomaterial Characterization
Week 5-6: Module 4: Protein-Material Interactions
Week 7-8: Module 5: Cell Culture
Week 9-10: Module 6: Cell-Material Interactions
Week 11-12: Module 7: Blood-Material Interactions
Week 13: Holiday (No Lab)
Week 14: Module 8: In vivo studies
Week 15: Lab Wrap up

***Online Course Recording***

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 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.

***Attendance Policy, Class Expectations, and Make-Up Policy***

This course is being provided asynchronously, meaning there is not established class time, but rather, lectures/lab videos, demos etc. will be recorded and posted online through Canvas. You are expected to view the lab exercises and complete the lab assignments on a weekly basis and submit your assignments through Canvas. Excused absences must be consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and require appropriate documentation. Missed or late assignments as a result of an excused absences may be made up provided that appropriate documentation is submitted. Contact instructor to arrange the make-up. Missed or late assignments under any other circumstances will not be accepted.

***Evaluation of Grades***

| Assignment | Percentage of Final Grade |
|---|---|
| Discussion Board | 10% |
| Quizzes | 10% |
| Experimental Design Project | 10% |
| Lab Reports | 70% |
| TOTAL | 100% |

**Discussion Board:**
Throughout the course, questions related to research will be posted on the Canvas Discussion Board. Your participation is required on these discussion posts. You are required to 1) post a new comment; and 2) post a comment in response to a classmate's comment. The discussion thread will be closed within 1 week of being posted.

**Quizzes:**
Select experimental demo/videos will be accompanied by a brief quiz related to the content. These quizzes are best taken immediately following viewing the demo/video. The quiz will be administered via Canvas.

**Experimental Design Project:**
Building off of the biomaterial experiments you will become familiar with; you will be given a Biomaterial research hypothesis and will prepare the experimental approach to test the hypothesis. Details of this assignment will be provided separately.

**Lab Reports:**
Following the lab demos/videos you will be given data from the relevant experiments. You will be required to analyze the data provided and submit a lab report. Details on Lab report format, grading, and expectations will be provided.

***Grading Policy***

| Percent | Grade | Grade Points |
|---|---|---|
| 92.0 - 100 | A | 4.00 |
| 88.0 - 91.9 | A- | 3.67 |
| 84.0 - 87.9 | B+ | 3.33 |
| 80.0 – 83.9 | B | 3.00 |
| 76.0 – 79.9 | B- | 2.67 |
| 72.0 – 75.9 | C+ | 2.33 |
| 68.0 – 71.9 | C | 2.00 |
| 65.0 – 67.9 | C- | 1.67 |
| 62.0 – 64.9 | D+ | 1.33 |
| 59.0 – 61.9 | D | 1.00 |
| 56.0 – 58.9 | D- | 0.67 |
| 0 – 55.9 | E | 0.00 |

More information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

***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**, 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 suppor***t*, 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.