

Senior Design, Professionalism, and Ethics I

BME4882 Section 1A49

Class Periods: T – Period 7 – 1:55p-2:45p, R – Period 7-8 – 1:55p-3:50p

Location: Turlington Hall, Rm L011

Academic Term: Fall 2025

Instructors:

Chris Geiger

cgeiger@bme.ufl.edu

Office Phone: (352) 273-9338

Office Hours: M,W 1:30p-3p, T,R 11a-12p or by appointment, BMS J293

Ismael “Tito” Arroyo

iarroyo@ufl.edu

Office: BME Design Space

If you would prefer to meet with me virtually during office hours via Zoom or Microsoft Teams, scheduling is **required**, **please email me with the date and time you would like to meet so I can ensure that time is available**. In addition to my open office hours, you can schedule a meeting with me through Calendly for times you would like to meet with me outside of my scheduled office hours:

<https://calendly.com/rcgeiger/>

If none of those times work with your schedule, please email me and we'll try to figure something out.

Outside of class and office hours, I prefer to be contacted via email and will make every effort to respond as quickly as possible (more quickly during the work week than on the weekend). As the instructor, I will do my best to follow the proposed course schedule as closely as possible. However, I also reserve the right to make necessary changes if the need arises.

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Please contact through the Canvas website

- Jessica Molina, TBD
- Ryan White, TBD

Course Description

Design of custom strategies to address real-life issues in the development of biocompatible and biomimetic devices for biotechnology or biomedical applications. Teams work with a client in the development of projects that incorporate various aspects of biomedical engineering including instrumentation, biomechanics, biotransport, tissue engineering and others. Emphasizes formal engineering design principles; overview of intellectual properties, engineering ethics, risk analysis, safety in design and FDA regulations are reviewed. Designs and prototypes are developed in BME 4882. 3 credits.

Course Pre-Requisites / Co-Requisites

BME 3012 with a minimum grade of C. Senior standing.

Course Objectives

Upon the completion of this course, students will:

1. Apply the design process methodology to the development of a solution to a biomedical engineering problem.
2. Demonstrate the process of ideating, designing, prototyping, and verifying a biomedical engineering related technology, device, or method.
3. Become effective communicating technical details and rationale for design decisions.
4. Gain experience working on teams, initiating tasks and reporting deliverables.
5. Appreciate the professional and ethical obligations of a professional biomedical engineer.

Materials and Supply Fees

Course Fees: \$95.82

Professional Component (ABET):

This course will prepare students to apply the design process to solve problems at the interface of engineering and medicine. Specific to the UF BME program educational outcomes, students will gain experience applying a knowledge of the design process to solving open problems and proving the feasibility of a prototype solution. An integral part of this experience will be the professional communication with industry, clinical and faculty experts as well as technical writing and presentations.

Relation to Program Outcomes (ABET):

Outcome	Coverage*	Teaching Level**
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	Low	Emphasized
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	High	Emphasized
3. An ability to communicate effectively with a range of audiences	High	Emphasized
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	High	Emphasized
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	Medium	Emphasized
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	High	Emphasized
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Medium	Emphasized

* Coverage is given as high, medium, or low. **Teaching Level corresponds to the sequential fit in the curriculum and is given as introduced, reinforced, or emphasized.

Recommended Textbooks and Software

- Title: Biodesign: The Process of Innovating Medical Technologies
- Authors: Zenios, Makower, Yock, Brinton, Kimar, Denend, and Krummel
- 2nd Edition, 2015
- ISBN number: 978-1107087354
- Web: <http://ebiodesign.org>

*Note – this book is free online via UF library. The website above also has videos, case studies and more.

- Title: Product Design and Development
- Authors: Ulrich and Eppinger
- 7th Edition, 2019
- ISBN number: 1260043657

Required Computer

Recommended Computer Specifications: <https://it.ufl.edu/get-help/student-computer-recommendations/>

HWCOE Computer Requirements: <https://www.eng.ufl.edu/students/advising/fall-semester-checklist/computer-requirements/>

Course Topics (see Canvas for specific class dates, assignments, and presentations)

- Design Process (including Problem Definition, Brainstorming, Concept Generation and Evaluation, Detailed Design, Fabrication and Validation)
- Experimental Design
- Project Management and Team Dynamics
- Regulations and Standards
- Intellectual Property
- Bioethics
- Technical Communication

Important Dates

Please consult Canvas for the most up to date schedule regarding class assignments, exams, etc.

Important university dates/deadlines: <https://catalog.ufl.edu/UGRD/dates-deadlines/2025-2026/#fall25text>

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is expected, required, and noted by the instructors for each class. Excess absences, class disruption, and lack of engagement will influence the class participation grade. All assignments are due at the beginning of class. Late work will not be accepted. If you experience an illness or an event that makes it challenging to keep up with course materials, please let me know ASAP - I am here to help.

Please review your student handbook to ensure that you understand the requirements for a university approved absence. Excused absences are consistent with university policies in the undergraduate catalog

(<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.

Evaluation of Grades

Assignment	Percentage of Final Grade
Class Deliverables (Team + Individual)	20%
Project Proposal	15%
Final Semester Project Presentation	25%
Design Innovation Notebook (Technical Documents)	30%
Peer Evaluation (Individual)	10%
TOTAL	100%

Grading Policy

Letter grade conversion plan:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
≥92	90-91	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	60-62	< 60

This course is an upper division critical tracking course. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. More information on UF grading policy may be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Academic Policies & Resources

To support consistent and accessible communication of university-wide student resources, instructors must include this link to academic policies and campus resources: <https://go.ufl.edu/syllabuspolicies>. Instructor-specific guidelines for courses must accommodate these policies.

Commitment to a Positive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values.

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

- Your academic advisor or Undergraduate Coordinator
- HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu