**BME 6938: Global Health in Biomedical Engineering**

Fall 2025

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| **Day** | **Periods** | **Time** | **Location** |
| Tuesdays | 5 & 6  | 11:45 – 1:40 pm | BLK 0315 |
| Thursdays | 6 | 12:50 – 1:40 pm | BLK 0315 |

**Instructor**

Prof. Ana Maria Porras

Email: aporras@bme.ufl.edu (please send messages through Canvas)

Office Hours: After Tuesday’s class - see Canvas for details.

**Course Description**

Explore how biomedical engineering can help solve some of the world’s most pressing global health challenges. Students will analyze current global health trends, evaluate context-specific engineering solutions, and consider the logistical, ethical, and cultural complexities of working in international settings. The course emphasizes student-centered learning through debates, small group discussions, collaborative presentations, and science communication assignments. Students are expected to participate actively in the course to develop critical thinking and intercultural communication skills essential for impactful global health work.

**Course Pre-Requisites / Co-Requisites**

None. Students with a basic knowledge of engineering principles will find themselves well-prepared for the information discussed in this course.

**Course Objectives**

Through participation in this course, students will:

* Assess the major challenges impacting global health
* Evaluate biomedical engineering approaches to address global health issues
* Design biomedical engineering solutions tailored to a specific global health problem
* Analyze and apply regulatory, ethical, financial, and logistical considerations when developing and evaluating global biomedical engineering projects
* Compare and integrate multiple disciplinary and cultural perspectives on engineering and global health
* Communicate effectively across different cultures

**Materials and Supply Fees**

None

**Required Textbooks and Software**

**Required Textbooks**

No specific textbook is required for this course. Course notes and assigned readings are derived from various published sources and professional records of the course instructor. These materials will be distributed through the course website on Canvas.

**Required Software**

No specific software is required for this course.

**Recommended Materials**

Over the semester, the students and instructor will collectively identify other useful resources for the class. Information on these resources will be distributed through the course website on Canvas.

***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/*

**Topics covered**

Refer to the course website for current schedule, pre-class materials, and due dates for assignments.

* **Unit 1: Current Global Health Challenges**
	+ Foundations
	+ Determinants of health worldwide
	+ Healthcare systems around the world
	+ Major global health challenges
	+ Barriers to global participation in BME
* **Unit 2: Biomedical Engineering Solutions to Global Health Problems**
	+ Biomaterials, Tissue & Cellular Engineering
	+ Biomechanics & Bionics
	+ Biomedical Imaging & Instrumentation
	+ Modeling & Biomedical Data Science
	+ Neural Engineering
* **Unit 3: Ethical and Implementation Challenges**
	+ Logistical, regulatory, cultural, and financial challenges
	+ Intercultural communication
	+ Ethics and human rights
	+ Equitable partnerships

**Evaluation of Grades**

|  |  |
| --- | --- |
| **Assignment** | **Percentage of Final Grade** |
| Pre-class content checks | 25% |
| Virtual exchange participation | 15% |
| Literature presentation | 10% |
| Assignments | 30% |
| Final Project | 20% |
|  | **100%** |

**Grading Policy**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Grade** | **A** | **A-** | **B+** | **B** | **B-** | **C+** | **C** | **C-** | **D+** | **D** | **D-** | **E** |
| **Percent** | 93.4-100 | 90.0- 93.3 | 86.7-89.9 | 83.4-86.6 | 80.0-83.3 | 76.7-79.9 | 73.4-76.6 | 70.0-73.3 | 66.7-69.9 | 63.4-66.6 | 60.0-63.3 | 0-59.9 |
| **Grade Points** | 4.00 | 3.67 | 3.33 | 3.00 | 2.67 | 2.33 | 2.00 | 1.67 | 1.33 | 1.00 | 0.67 | 0.00 |

More information on UF grading policy may be found at:

[UF Graduate Catalog](https://catalog.ufl.edu/graduate/?catoid=10&navoid=2020#grades)
[Grades and Grading Policies](https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/)

**Course Policies**

**Attendance Policy, Class Expectations, and Late Policy**

**Pre-class content checks:** Students are expected to engage with the course material both inside and outside of class. Students will be assigned materials (e.g. book chapters, videos, podcasts, or research articles) weekly to prepare for in-class activities. Reviewing that material should take ~60-90 mins per week. To ensure students are ready to participate in class, they will complete content checks (i.e. quizzes, discussion posts, or similar assignments) prior to arriving in class.

**Class attendance and participation:** While class attendance is not mandatory, students are expected to attend scheduled class sessions. This class is based on active learning pedagogical practices that encourage discussion and participation. Attending class is critical to engage with the course material and internalize course content. Recordings of the class will not be provided by the instructor.

**Virtual exchange:** During a period of ~6 weeks, students in the class will interact with peers at Universidad Pontificia Javeriana in Bogotá, Colombia through synchronous and asynchronous virtual activities. Through these interactions students will have the opportunity to develop intercultural communication skills and ask questions to better understand global health challenges relevant to the class project described below. Further details will be discussed in class.

**Project assignments:** Throughout the semester, students will work on identifying a specific global health challenge and developing a potential solution for this problem. Students will complete two assignments where they will first identify the global health need and pitch an initial proposed solution. These assignments will help the students work towards their final projects and develop their science communication skills. When possible, there will be in-class time devoted to these assignments. Assignments will be submitted through Canvas.

**Literature presentation:** The literature presentation is an opportunity for students to practice contextualizing the literature, presenting, and leading discussion. Students will work in small groups to present one paper on a biomedical engineering solution to a global health problem. Further details will be discussed in class and distributed on the course website

**Final project deliverables:** The final project allows students to design their own biomedical engineering solution to a global health challenge. Students will work in teams to prepare these final deliverables. Further details on the project will be discussed in class and distributed on the course website.

**‘Life-happens’ policy for pre-class content checks:** Graduate school is a busy stressful time on top of a variety of general life obligations. It is understandable that students may not be able to complete all content checks prior to arriving to class. To account for unforeseen events, students are permitted 2 unexcused missed content checks, no questions asked. Beyond that point, documentation of a university approved absence is required.

**Revision and Resubmission Policy:** Students have the opportunity to revise and resubmit the two assignments in the “Project Assignments” category. Feedback will be provided within one week of the original submission. The quality of feedback will be proportional to the effort shown in the initial submission. Revised assignments must be submitted within two weeks of receiving feedback and include a brief reflection (100-200 words) explaining the changes made. The new grade will replace the original grade, with the first submission accounting for 60% and the revised submission for 40% of the final grade for that assignment.

**Late assignments:** All due dates and times will be communicated in class and on the course website. Students will lose 10% on the assignment final grade for every day the assignment is late. In cases where an excused absence may justify a delay, see policy below.

**Excused absences:** In case a student is unable to attend class on a date where an assignment is due (e.g. a presentation day), they should inform the instructor as soon as possible to identify an acceptable alternative. Excused absences must be consistent with university policies in the Graduate Catalog (<https://catalog.ufl.edu/graduate/regulations>) and require appropriate documentation. Additional information can be found here: <https://gradcatalog.ufl.edu/graduate/regulations/>

**Re-Grade Policy:** If a student feels that an assignment or exam was graded incorrectly, they should return the assignment and a written description of the grading error to the instructor within 5 business days of receiving the graded assignment. The instructor will evaluate the request and adjust the grade if an error was made. Any request for re-grading where the student has altered the assignment after it was returned to gain a grade benefit will be considered a violation of the University honor code.

**ChatGPT and AI Tools Policy:** The use of generative AI tools (e.g. ChatGPT, Dall-e, etc) is permitted in this course for the following activities:

* Brainstorming and refining your ideas
* Fine tuning your problem statements and solutions
* Translating statements, articles, or conversations
* Finding information on your topic
* Drafting and outlining to organize your thoughts
* Checking grammar and style; rewording and editing
* Creating individual images, icons, or graphics to be used in presentations or assignments

The use of generative AI tools is not permitted in this course for the following activities:

* Impersonating you in classroom contexts, such as using the tool to create answers for content checks, provide feedback to classmates, or content that you put into a Teams, Zoom, or WhatsApp chat
* Completing group work that your group has assigned to you, unless it is mutually agreed upon that you may utilize the tool
* Writing a draft of a writing assignment
* Writing entire paragraphs or papers to complete class assignments

You are responsible for the information you submit based on an AI query (for example, that it does not violate intellectual property laws, or contain misinformation or unethical content). Your use of AI tools must be reported in the assignment – I will prompt you to disclose this information. Any assignment that is found to have used generative AI tools in unauthorized ways, will receive a 50% penalty. When in doubt about permitted usage, please ask for clarification.

**Changes to the Syllabus:** Occasionally, course policies may need to be changed due to unforeseen circumstances or to improve the course. The instructor reserves the right to make necessary changes. Additionally, if a student or group of students have a suggestion on how to revise the course and the instructor agrees that the revision would improve the course, the proposed change will be put to an anonymous vote by the entire class. If 75%+ of the class agrees to the change, it will become part of the syllabus.

**Potential Use of Classroom Materials for Research Studies**

As part of my ongoing efforts to improve teaching and learning in this course, some of the reflections and discussion activities from this class may be used in future educational research studies. These studies aim to better understand how students learn and to enhance instructional strategies for future classes. If any materials are used for research, all direct personal identifiers (e.g. names, UF IDs, etc.) will be removed before analysis. Data coding and analysis will take place after the semester ends and grades have been submitted. The data will be securely stored following university policies, and only aggregate, de-identified results will be reported. Any research involving these materials will be reviewed and approved by the University of Florida Institutional Review Board. During the first two weeks of class, I will request your written consent to include your work in any future research studies. Participation is entirely voluntary, and your decision whether to allow this data to be part of a future study will not affect your grade or standing in the course in any way. If you have questions or concerns about this potential research, please feel free to contact me directly.

**Communication**

**Communicating with the Instructor**

Prof. Porras will do her best to be available to all students for questions and discussion. Please use only your official UF email address to communicate with Dr. Porras and use Canvas when sending messages for automatic association with the class including “BME 6938” in the subject line. Please allow up to 48 hours for Dr. Porras to respond, longer if at night or on the weekend/holidays/breaks. Class announcements will be posted to Canvas. All students are responsible for ensuring awareness of these postings.

**Inclusion Statement**

This class will cover a variety of topics where we might encounter differences in opinion and cultures. It is my intention that students from all backgrounds and perspectives will be well served by this course and that the different experiences that students bring to this class will be viewed as an asset. I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, socioeconomic background, family education level, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming, and safe learning environment for every other member of the class. Together, we will construct ground rules of communication for this course. Your suggestions are encouraged and appreciated.

**Lived Name / Pronoun Statement**

I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that we may make appropriate changes to our records.

**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.

Parents and caretakers needing accommodations should contact Dr. Porras as soon as possible. We will work together to find solutions that don't ask you to fully compromise your personal responsibilities.

**Relevant University Academic Policies & Resources**

All course policies were designed in agreement with university-wide academic policies. Further information related to these policies, the University’s Honesty policy, class recordings, and campus resources can be found here: <https://go.ufl.edu/syllabuspolicies>.

**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 by discrimination or harassment of any kind, please contact your instructor or any of the following:

• Ade Kuyumi, BME graduate academic advisor, 352-273-9321, grad@bme.ufl.edu

• 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