

# BME 6938: Global Health in Biomedical Engineering

## Fall 2023

Day	Periods	Time	Location
Tuesdays	7 & 8	1:55 – 3:50 pm	COMM G-67
Thursdays	7	1:55 – 2:45pm	HPNP G307

### Instructor

Prof. Ana Maria Porras

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

Office Hours: By appointment at NEB 351 or on Zoom, see Canvas for details

### Course Description

This course will introduce some of the grand challenges in global health. We will explore the role of biomedical engineers in addressing these challenges. The logistical, ethical, and cultural issues that arise when collaborating in global settings will also be considered. Students are expected to participate actively in the course. It will incorporate a mix of learning modalities including debates, small group discussions, group presentations, and science communication assignments. This is a 3-credit course.

### Course Pre-Requisites / Co-Requisites

No formal requirements. 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:

- Understand the major challenges in global health
- Examine biomedical engineering approaches to address global health issues
- Design biomedical engineering solutions tailored to a specific global health problem
- Appreciate major considerations (e.g. regulatory, ethical, financial, and logistic) when creating and implementing biomedical engineering research and technologies internationally
- Explore multiple perspectives (disciplinary and cultural) 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

None

### 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.

## 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
  - Barriers to global participation in BME
  - Major global health challenges
- **Unit 2: Biomedical Engineering Solutions to Global Health Problems**
  - Basic science
  - Prevention
  - Screening & diagnosis
  - Treatment
  - Rehabilitation
- **Unit 3: Ethical and Implementation Challenges**
  - Intercultural communication
  - Ethics and human rights
  - Logistical, regulatory, cultural, and financial challenges
  - Equitable partnerships

## 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 45-90 mins at most 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:** 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.

**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

**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.

**Final group 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.

**Late assignments:** All due dates and times will be communicated in class and on the course website. Students will lose 5 points 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 outline 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 sentences, 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 30% 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 the majority of the class agrees to the change, it will become part of the syllabus.

### Evaluation of Grades

Assignment	Percentage of Final Grade
Pre-class content checks	20%
Virtual exchange participation	15%
Literature presentation	15%
Assignments	25%
Final Project	25%
	<b>100%</b>

### 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](#)  
[Grades and Grading Policies](#)

### 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 3689” 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 diversity 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 inclusive 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 Policies**

### **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.a.a.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.a.a.ufl.edu/public-results/>.

### **In-Class Recording**

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

### **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/process/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.

## Plagiarism

Plagiarism is a common infraction to the UF Honor Code. If you are confused as to what constitutes plagiarism, see <https://guides.uflib.ufl.edu/copyright/plagiarism>. Plagiarism on any of your assignments **will be reported to the Dean of Students as a UF Student Honor Code violation**. Also, note that **copying solutions for any assignment, regardless of the source (e.g. other students, pirated website solutions), will be treated as plagiarism**. If you have any questions or concerns, please consult with the instructor in this class. Note that failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures

## 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
- HWCOE Human Resources, 352-392-0904, [jpennacc@ufl.edu](mailto:jpennacc@ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto: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](mailto: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:** <https://counseling.ufl.edu>, 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](mailto: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](mailto:Learning-support@ufl.edu).  
<https://lss.at.ufl.edu/help.shtml>.

**Career Connections Center**, Reitz Union, 392-1601. Career assistance and counseling;  
<https://career.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://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

**On-Line Students Complaints**: <https://distance.ufl.edu/state-authorization-status/#student-complaint>.