Introduction to Bioengineering!

BIOE 100
Fall 2025
Campus Instructional Facility 0035

Location:
Campus Instructional Facility 0035

Class Time:
Monday and Wednesday
12:00- 12:50 PM

Instructor:
Dr. Ali Ansari, Bioengineering Department
Office Location:
Everitt Building Room 3244
Email:
aansari2@illinois.edu
Office Phone: 217-333-5333
Drop By/Office Hours:
Please feel free to come by whenever you need to, I am usually in my office. If this is something that may take a longer time to chat about, please send me an email! I will also schedule certain hours that I will be in my office for sure, so if you forget to send an email, I should be there for these. *Scheduled Friday 3-4 PM, knock on my office door. Can also be via Zoom if need be, just let me know.*

Learning Objectives

By the end of this course, you will be able to:
1. Meet department students, faculty, and staff.
2. Understand the curriculum and 4-year goals.
3. Explore bioengineering as a field and practice.
4. Explore technologies in the field through team projects.
5. Identify current and future career opportunities for Bioengineers

Course Description:
Introduction to Bioengineering provides a broad introduction to the field, practice, and curriculum of Bioengineering. Students will meet faculty, staff, and other students in the department to learn about opportunities available to undergraduates. Student teams will complete three introductory projects using tools and methods bioengineers use to solve complex biological and healthcare challenges. These concepts may sound very intimidating and overwhelming, but the intent is to give you a set of tools to work with. Perhaps you won't use every tool in your bag for every situation, but knowing what each tool is and how to use them is always going to be useful. Try to frame this course in that way, and I hope that you will find this course to be both interesting and hopefully fun.

Method of Instruction

This class will be project and lecture driven to maximize the amount of experience that the students can have in various branches of bioengineering and explore aspects of the field. There are no tests and no quizzes for this course. Instead, there will be three main projects that will constitute a majority of the grade.

Class Structure (units, topics, periods, texts, divisions):

Weeks 1-7: Introduction and Project 1 (Physiology)
Weeks 7-12: Introduction to Signals and Project 2 (Signal Analysis)
Weeks 12-15: Introduction to Imaging and Project 3 (Image Processing)

Assignments/Activities:
Formative Activities (Lesson based Learning): Homework, In-Class Exercises
Summative (Cumulative) Activities: Projects

This course focuses on two main objectives: the first is familiarizing the students with the idea that the field is an intersection of a variety of different tracks and topics which are all equally viable, and then contextualizing them with the skills to be able to take that representation and use it to interact and measure certain phenomena.

Textbook:
There is no required textbook for this course. MATLAB will be required which may necessitate that you use either Citrix, purchase a student license, or use MATLAB for free in an Engineering Lab. Other equipment will be provided by the class and will require that that they are returned before the class is over. :)

Homework:
The intent is to have most if not all homework assignments be tied to your group projects. These will constitute the progress checks to make sure that everything is going well. Aside from that, any surveys or necessary clerical stuff will also fall into this category.

Quizzes/Tests:
There will be no quizzes in this class. Although quizzes can be useful, in this class, it is far more clear that a concept is mastered if you can create and present the project successfully.
There will also be no tests. No finals. Please do not worry, if you can do the projects well, you are doing a phenomenal job. :)

Projects:
There will be three main projects corresponding to three to four of the main tracks that our bioengineering field focuses on. Each of these projects are team based and will require specific components to get full points. A certain amount of bonus points can be achieved if additional objectives are attempted, but each project will be worth a majority of the possible points needed to get sufficient points to pass. :)

Scoring:
I wanted to try something a little different and new and make each point awarded equivalent. That means instead of having homework average being a certain percentage of the score, instead, it is weighed equivalently with a grand total of 500 points being awarded throughout the course. That means that there will be 100 points allotted for Professionalism and Participation, with the last bit being 100 points for homework.

Grading:
The performance of a student in each course is evaluated on the grade report by the use of the following symbols:

Grade	Point Range
A+	485-500
A	465.0-484.5
A-	450-464.5
B+	435-449.5
B	415-434.5
B-	400-414.5
C+	385-399.5
C	365-384.5
C-	350-364.5
D+	335-349.5
D	315-334.5
D-	300-314.5
F	0-299.5

Tentative Course Schedule:

	Date		Lecture Topics Covered	Assignments Due
1	Mon	August 25th	Introduction to BIOE 100! Syllabus Overview and Expectations! Day 1 and CATME Surveys!	
	Wed	August 27th	Group Assignment and Ice Breakers!	Day 1 Survey!
2	Mon	September 1st	Labor Day No classes!	
	Wed	September 3rd	Guest Lecture- Dr. Caroline Cvetkovic Background on Physiology and Project 1 Intro	Google Slide Creation Data Spreadsheet Creation Due
3	Mon	September 8th	Working in Teams and Creating a Hypothesis and Project 1 Questions!	Team Contract Due
	Wed	September 10th	Guest Lecture- Dr. Yuan Yang Introduction to ABC's of BIOE Final Project and Project 1 Pulse Ox Measurements!	
4	Mon	September 15th	Introduction to Statistics and Excel!	Hypothesis Check
	Wed	September 17th	Guest Lecture- Dr. Seonyeong Park Introduction to MATLAB	Data Check in/ Sample Size Estimation
5	Mon	September 22nd	Final Slides Components Project 1 Work Day!	MATLAB Onramp Due Individual Welcome Slide
	Wed	September 24th	Guest Lecture- Dr. Enrique Valera Preliminary Data Sharing in Groups!	MATLAB Plot Creation
6	Mon	September 29th	Project 1 Work Day!	Initial Results Slides
	Wed	October 1st	Initial Results Exchange!	Initial Results Exchange
7	Mon	October 6th	Final Slide Set- Project Work Day!	Survey for Team Composition
	Wed	October 8th	Project 1 Workday! (BMES)	
8	Mon	October 13th	Project 2 Introduction Project 1 Wrap Up and Final Questions!	Final Project 1 Slides Due at Midnight.
	Wed	October 15th	Guest Lecture- Dr. Min Jee Jang Introduction to Signals! Survey Results	
9	Mon	October 20th	Project 2 Self- Work Day! Introduction to Audacity	**P2 Audio Recording Plan Due**
	Wed	October 22nd	Project 2 Work Day Guest Lecture- Dr. Rebecca Reck	Initial Audacity Analysis Due
10	Mon	October 27th	Signal Processing Continued!!	
	Wed	October 29th	Project 2 Work Day	Initial MATLAB Analysis Due
11	Mon	November 3rd	Guest Lecture- Dr. Rohit Bhargava Project 2 Work Day	
	Wed	November 5th	Project 2 Work Day	
12	Mon	November 10th	Guest Lecture- ?? Work day!	Project 2 Final Slide Deck Due
	Wed	November 12th	Introduction to Project 3 Work Day!	
13	Mon	November 17th	Guest Lecture- ?? Undergraduate Curriculum Lecture!	Lab One!
	Wed	November 19th	Project 3 Work Day!	

14	Mon	November 24th	YOU ARE FREE	
	Wed	November 26th	NO CLASS	
15	Mon	December 1st	Guest Lecture-?? Project 3 Work Day!	
	Wed	December 3rd	Project 3 Work Day!	
16	Mon	December 8th	Overflow Presentations/Course Debrief/Party!	Complete Slide Deck Submission in Canvas! ABCs Project Due
	Wed	December 10th	Overflow Presentations/Course Debrief/Party!	Complete Slide Deck Submission in Canvas! ABCs Project Due

Course Mechanics:

Policies:

As far as I am currently aware, these classes are intended to be in person for the time being. As such, your attendance is strongly recommended and expected. Because Wednesdays are working with your team, your attendance is necessary to make sure that you are able to complete the project in time. You are all full adults here, so if you will be missing, **you have to let me know in advance.** If you want to provide a reason, then that is fine, but if you warn me, I can prepare for it. If for some reason, the university moves back to digital formats, I shall upload all the material to the class website and it will be available to all students, whether on campus or attending remotely. Honestly, your safety is paramount to me, so please do whatever makes you feel safest.

For make up assignments and homework, please contact me **IN ADVANCE,** so I can prepare an assignment for you. If something unforeseen occurs, please contact me and we can figure out how best to address it. I also would like to meet with you in office hours/Zoom if a class is missed in this way. If unexcused absences start becoming a problem, then we may need to meet to discuss solutions, as they will make it difficult to successfully complete the projects and will definitely impact your overall experience and grade.

If you are seriously ill or experiencing a family emergency that will impact two classes or less, contact Dr. Ansari via e-mail as soon as possible. If you need an extension on an assignment, arrangements must be made with Dr. Ansari before the assignment due date. If your illness or emergency lasts longer than three days (or two classes), you should request an absence letter from the Office of the Dean of Students: https://odos.illinois.edu/community-of-care/resources/students/absence-letters . Letters should be requested within 10 days of returning. If you test positive for COVID-19 at an on-campus testing facility it will be automatically recorded.

Expectations:

All assignments will have a reasonably-allotted window of time for completion/participation. If at any time you feel you can not access course materials or complete an assignment in the allotted time, please contact me via email with any requests for deadline extensions or assistance. I will hold weekly "office hours" and if you have classes during those times, I can be free other time periods as long as you let me know in advance. If you cannot make either of those, or feel uncomfortable meeting in person, you can contact me directly in Zoom via Office hours w/ Prof. Ali Ansari: Zoom ID:352 339 1708. Students may also email me to request specific meeting times and my current schedule and availability are posted in my Google Calendar. Any students who do not attend live/synchronous course meetings or events are expected to attend at least one "office hours" session (or one they schedule) within 7 days of missing the meeting/event. Please email me if this presents any issues and we will work together to find a mechanism that works better for you.

Class Participation:
Students are expected to engage with the course material to the extent possible based on their location and situation. We aim to foster an inviting and open environment that everyone can feel comfortable sharing in. As such, students are all expected to read/view all posted materials, and complete all assigned work and assessments in a timely manner to best facilitate this environment.

Inclusion and Disability Statements:
To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the as soon as possible. To ensure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class should contact Disability Resources and Educational Services (DRES) and see the instructor as soon as possible. If you need accommodations for any sort of disability, please speak to me after class, or make an appointment to see me or see me during my office hours. DRES provides students with academic accommodations, access, and support services. To contact DRES you may visit 1207 S. Oak St., Champaign, call 217-333-4603 (V/TDD), or e-mail disability@illinois.edu , http://www.disability.illinois.edu/

Mental Health:
Mental health is extremely important for everyone here, and I urge to take it into account. Significant stress, mood changes, excessive worry, substance/alcohol misuse or interferences in eating or sleep can have an impact on academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings which are covered through the Student Health Fee. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do for yourself and for those who care about you. Please also feel free to chat with me if there is anything I can do to try to help. You all deserve the absolute best, and I want you to treat yourself that way. :)

- Counseling Center (217) 333-3704
- McKinley Health Center (217) 333-2700
- National Suicide Prevention Lifeline (800) 273-8255
- Rosecrance Crisis Line (217) 359-4141 (available 24/7, 365 days a year)
  If you are in immediate danger, call 911.

Equity & Inclusion Statement:
This classroom has a zero tolerance for any kind of discrimination or intolerance. It has no place here or anywhere else on campus let alone outside of it. As you all have the right to fully respected and treated fairly and kindly, if at any point you do not feel welcome or comfortable, please tell me immediately and we will work together to make sure that is remedied as soon as possible. If you don't feel comfortable speaking to me, please don't hesitate to reach out to any of the other professors or deans or even the Director of Graduate Studies who may be able to help you. Additionally, I intend on making this an inclusive and accepting environment that hinges on your comfort in the classroom. This means, if there are issues that affect your learning, as perhaps learning English as a second or so language, and thus requiring more time in reading, presenting, or difficulties in hearing, or anything else, please do not hesitate to talk to me, as I can possibly help deal with this.

The Grainger College of Engineering is committed to the creation of an anti-racist, inclusive community that welcomes diversity along a number of dimensions, including, but not limited to, race, ethnicity and national origins, gender and gender identity, sexuality, disability status, class, age,

or religious beliefs. The College recognizes that we are learning together in the midst of the Black Lives Matter movement, that Black, Hispanic, and Indigenous voices and contributions have largely either been excluded from, or not recognized in, science and engineering, and that both overt racism and micro-aggressions threaten the well-being of our students and our university community.

The effectiveness of this course is dependent upon each of us to create a safe and encouraging learning environment that allows for the open exchange of ideas while also ensuring equitable opportunities and respect for all of us. Everyone is expected to help establish and maintain an environment where students, staff, and faculty can contribute without fear of personal ridicule, or intolerant or offensive language. If you witness or experience racism, discrimination, micro-aggressions, or other offensive behavior, you are encouraged to bring this to the attention of the course director if you feel comfortable. You can also report these behaviors to Campus Belonging Resources (https://diversity.illinois.edu/diversity-campus-culture/belonging-resources/). Based on your report, Members of the Office of the Vice Chancellor for Diversity, Equity & Inclusion staff will follow up and reach out to students to make sure they have the support they need to be healthy and safe. If the reported behavior also violates university policy, staff in the Office for Student Conflict Resolution may respond as well and will take appropriate action.

Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem and may be reported to the Office for Student Conflict Resolution (https://conflictresolution.illinois.edu ; conflictresolution@illinois.edu ; 217-333-3680) for disciplinary action.

Accommodating Religious Holidays:
Additionally if you have a religious holiday that is placed during the semester please let me know ahead of time so I can also accommodate that as well. This does not count as an unexcused absence, but you will have to make up anything that you may miss, but we can discuss it if it does happen. Religious observances are an example of a planned absence. Students should complete the Request for Accommodation for Religious Observances form (https://cm.maxient.com/reportingform.php?UnivofIllinois&layout_id=19). In order to best facilitate planning and communication, please requests for absence letters as early as possible.

Academic Integrity:
The University of Illinois Urbana-Champaign Student Code should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: http://studentcode.illinois.edu/
Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: https://studentcode.illinois.edu/article1/part4/1-401/
Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

Masking Policy:
In accordance with the University's rule that makes masks optional, please feel free to make your own discretion on whether to mask or not. I will most likely be masked as to prevent me from getting you all sick, but in return for the freedom to choose, I only request one thing. DO NOT COME IN TO CLASS SICK. If you take your entire team out with a disease, we all suffer. Send me an email before class and let me know what is happening. If you are sick and come in, I reserve the right to ask you to leave. Anything due we can discuss at a later point. Your health and wellbeing is paramount, and I intend to maintain it as much as possible.

Sexual Reporting Obligations:
The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX and Disability Office. In turn, an individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.
A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: https://wecare.illinois.edu/resources/students/#confidential
Other information about resources and reporting is available here: https://wecare.illinois.edu

Use of Generative AI Technology:
Generative AI, such as ChatGPT, Bard, and Microsoft Copilot/Bing Chat, can answer questions and generate text, images, and other media. The appropriate use of generative AI varies from course to course. In BIOE100, there are times when generative AI may be useful in the course. If you choose to use generative AI as permitted below, you must document and attribute all AI contributions to your coursework and take full responsibility for the contributions including the accuracy of the information and reliability of sources. When using generative AI, keep a journal documenting prompts, AI responses, and your usage. Your instructor may ask you to provide this documentation.

You may use generative AI in BIOE100 for the following:
- Revising your own text for spelling and grammar
- Creating study aids (e.g., flashcards) for quizzes or exams
- Testing and practicing your knowledge of course topics
- Conducting basic research on the course and assignment topics

You MAY NOT use generative AI in BIOE100 for the following:
- Generating data for experiments conducted in the course
- Writing entire sentences, paragraphs, or papers to complete class assignments
- Solving technical design problems.

If you have a question about the use of Generative AI, please reach out to your instructors. Failure to abide by these guidelines is a violation of academic integrity. We will investigate suspected uses of generative AI that do not follow these guidelines and apply sanctions as outlined in the Illinois Student Code.

Thank you very much for reading this far, I am extremely excited to teach you all and wish you all a wonderful semester! :)