



## BIOE 120: Introduction to Bioengineering

**Meeting time:** Monday 10:00 – 10:50 AM

**Location:** Campus Instructional Facility (CIF) 4031

**Credit hours:** 1

**Semester:** Fall

**Prerequisites:** N/A

### Instructor Information

Name	Caroline Cvetkovic, Ph.D.
Contact Information	<a href="mailto:ccvetko@illinois.edu">ccvetko@illinois.edu</a>
Office location	Everitt Lab 3138
Office hours	By appointment

### Course Description

Central themes for BIOE 120 (for non-majors) include *engineering solutions to clinical problems and the technology innovation aspects of biomedical science*. We will discuss topics at the intersection of human health, human biology, and engineering. Lectures and discussions will cover recent trends in bioengineering; and will range from biological interaction with ultrasound and microwave radiation, modeling, instrumentation, biomaterials, biomechanics, biological heat and mass transfer, and medical imaging techniques.

### Philosophy of Instruction

Classroom time will be comprised of mini-lectures from experts in the field of bioengineering, with numerous in-class questions completed in real-time by the students. Active learning provided through in-class participation and discussions will provide a fun learning experience for the students. Topics will be approached through real-world examples.

### Course Objectives

- Identify real-world biomedical problems.
- Identify technology gaps and innovation needs.
- Propose problem solving strategies in the clinical context.

### Course Format

This class meets for one 50-minute lecture period each week during the Fall semester.

### Tentative Schedule of Topics

In this course, the topics may include, but are not limited to:

- Biomedical optics
- Medical imaging
- Cancer bioengineering
- Orthopedic medical devices
- Modeling and data science
- Infectious disease diagnostics
- Micro and nanotechnologies
- Neuroengineering
- Biomedical ethics
- Medical and biological simulations
- STEM labs
- Careers in bioengineering

Please note that the instructor reserves the right to make changes to the schedule at any time if necessary. Every effort will be made to convey the changes to the students in a timely manner.

## Textbook and Reading Materials

No textbook is required. Reading materials relevant to the content may be assigned.

## Course Website

The Canvas site (<https://canvas.illinois.edu/courses/37157>) will be used for course materials, relevant reading, assignments, grading, lecture slides (if applicable), and announcements.

## Grading

Attendance and Participation	40%
Assignments	60%

**Attendance and Participation:** Students are expected to attend every class, and are responsible for all materials and announcements given during class time. Students should pay attention to the lecture, participate in class discussions, ask questions (at least 1 throughout the semester), and review pre-lecture material if applicable. 1 absence is permitted per semester.

**Assignments:** This portion of the grade (60% total) is comprised of the following. More information will be provided in class. All assignments will be submitted on Canvas.

- Post-lecture reflection questions (40%): Short-answer questions will be posted on Canvas after each lecture and due by the following class period. The lowest score will be dropped.
- Seminar assignment (10%): Students are expected to attend a bioengineering-related seminar and complete a relevant assignment.
- Research assignment (10%): Students will work in groups to present a project idea at the end of the semester.

The grading scale is as follows:

≥97.0	A+	≥87.0	B+	≥77.0	C+	≥67.0	D+
≥93.0	A	≥83.0	B	≥73.0	C	≥63.0	D
≥90.0	A-	≥80.0	B-	≥70.0	C-	≥60.0	D-

## Course Policies

### Late Policy:

- An assignment submitted within 24 hours after the deadline will lose 10% of the total points.
- An assignment submitted 24-48 hours after the deadline will lose 20% of the total points.
- No credit will be received after 48 hours past the assignment deadline.

**Course-Related Communication:** Email communication is preferred between students and the instructor. The Canvas discussion board will be occasionally monitored by the instructor. There is no guarantee that communication sent after 5:00 pm will be answered that same day. Please include “[BIOE 120 FA23]” in the subject line of the email.

**Laptops and Mobile Devices:** Mobile devices should be silenced and out of sight during class. Laptops and mobile phones may be used for course-related tasks only (e.g., to take notes or investigate relevant topics, answer polling questions) and not for other coursework or email.

**Academic Integrity:** Academic dishonesty may result in a failing grade. All students in the course are expected to:

- Read and abide by the University of Illinois at Urbana-Champaign Student Code (<http://studentcode.illinois.edu/>), including Article 1, Part 4: Academic Integrity (the Academic Integrity Policy can be found at <https://studentcode.illinois.edu/article1/part4/1-401/>).
- Submit assignments with original work only.
- Uphold the highest ethical standards, be honest, and practice academic integrity. TurnItIn will be used to check for plagiarism in assignments uploaded to Canvas.
- Ask the instructor(s) if in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity. Ignorance is not an excuse for any academic dishonesty.

## University Policies and Resources

**DRES Accommodations:** To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor as soon as possible and provide the instructor with a Letter of Academic Accommodations from Disability Resources and Educational Services (DRES). To ensure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class should apply for services with DRES and see the instructor as soon as possible. If you need accommodations for any sort of disability, please speak to the instructor. DRES provides students with academic accommodations, access, and support services. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 217-333-1970, e-mail [disability@illinois.edu](mailto:disability@illinois.edu), or visit the [DRES website](https://www.disability.illinois.edu/applying-services). Apply for services at <https://www.disability.illinois.edu/applying-services>.

**Mental Health:** Diminished mental health, including significant stress, mood changes, excessive worry, substance/alcohol abuse, or problems with eating and/or sleeping can interfere with optimal 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.

- Counseling Center: 217-333-3704, 610 East John Street, Champaign, IL 61820
- McKinley Health Center: 217-333-2700, 1109 South Lincoln Avenue, Urbana, IL 61801
- University of Illinois Wellness website: <https://wellness.illinois.edu/>
- 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.

**Community of Care:** As members of the Illinois community, we each have a responsibility to express care and concern for one another. If you come across a classmate whose behavior concerns you, whether in regards to their well-being or yours, we encourage you to refer this behavior to the [Student Assistance Center](#) (SAC; 217-333-0050). Based on your report, the staff in the Student Assistance Center reaches out to students to make sure they have the support they need to be healthy and safe.

Further, as a Community of Care, we want to support you in your overall wellness. We know that students sometimes face challenges that can impact academic performance (examples include

mental health concerns, food insecurity, homelessness, personal emergencies). Should you find that you are managing such a challenge and that it is interfering with your coursework, you are encouraged to contact the SAC in the Office of the Dean of Students for support and referrals to campus and/or community resources.

**Disruptive Behavior:** 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 \(conflictresolution@illinois.edu\)](mailto:conflictresolution@illinois.edu) for disciplinary action.

**Emergency Response:** Emergency response recommendations can be found at the following websites:

- Emergency preparedness: <http://police.illinois.edu/emergency-preparedness/>
- Campus building floor plans: <http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/>
- "Run, Hide, Fight": <https://police.illinois.edu/emergency-preparedness/run-hide-fight/>

**Religious Observances:** Illinois law requires the University to reasonably accommodate its students' religious beliefs, observances, and practices regarding admissions, class attendance, and the scheduling of examinations and work requirements. Students should complete the [Request for Accommodation for Religious Observances](#) form should any instructors require an absence letter in order to manage the absence. In order to best facilitate planning and communication between students and faculty, students should make requests for absence letters as early as possible in the semester in which the request applies. Within the first 2 weeks of classes, if possible, notify your instructor of potential conflicts and [request appropriate accommodations](#).

**Sexual Misconduct Reporting Obligation:** 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: [wecare.illinois.edu/resources/students/#confidential](http://wecare.illinois.edu/resources/students/#confidential). Other information about resources and reporting is available here: [wecare.illinois.edu](http://wecare.illinois.edu).

**Family Educational Rights and Privacy Act (FERPA):** Any student who has suppressed their directory information pursuant to Family Educational Rights and Privacy Act (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See <https://registrar.illinois.edu/academic-records/ferpa/> for more information on FERPA.

**Diversity and Inclusion:** We value all students regardless of background and am committed to fostering a climate of inclusion in the classroom. The diversity of participants in this course is a valuable source of ideas, problem solving strategies, and engineering creativity. If you feel that your or any other student's contribution is not being valued for any reason, please speak with us directly or submit anonymous feedback.

*Grainger College of Engineering Statement on Anti-Racism and Inclusivity:* 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 the [Bias Assessment and Response Team \(BART\)](#). Based on your report, BART members 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.

*COVID-19 and illness policy:* Refer to <https://covid19.illinois.edu/> for the most updated guidance and safety policies. Following University policy, all students are required to follow the campus COVID-19 protocols and engage in appropriate behavior to protect the health and safety of the community.