

BIOE 498_598: Soft Robotics

Course Term and Year: Fall 2025

Course Duration: Full semester

Course Format: In person(498 and 598SR1), Online (598SR0)

Course Location: 2233 Everitt Laboratory (regularly) and occasionally 1229 Everitt Laboratory

Weekly Hours of Expected Student Work, apart from instruction time: Students are expected to spend 9–12 hours outside of class per week. This equates to 3 hours per credit hour of class.

Credit hours: BIOE498: 3 credits, BIOE598: 4 credits

Instructor Information

Holly Golecki, PhD

Department of Bioengineering

University of Illinois at Urbana-Champaign

3134 Everitt Laboratory, 1406 Green St. Urbana, IL 61801

Office phone number: (217) 333-0085

Email: golecki@illinois.edu

Office Hours and Location: Professor Golecki will be available on in 3134 Everitt and on Zoom for live office hours on Tuesdays 11am-12pm. See Canvas site for Zoom link.

Teaching Assistant Information

TA Names and Contact Info:

Skye Shepherd (skyes2@illinois.edu)

Course Learning Objectives

In this course students will:

- Apply fundamentals of polymer chemistry and sensors to understanding wearable devices and soft robots.
- Read and discuss current literature in the field.
- Build actuators and sensors using polymer molding and fabrication techniques.
- Design novel advances in bioinspired, wearable, or implantable soft robots.
- Students will be assessed based on problems sets, build reports, a design project, and 598 only: journal club presentations.

Course Description

The field of soft robotics emerged as a solution to compliance matching between robots and humans. From wearable or implantable robots to bioinspired robots, soft materials serve as the basis for the latest advances in this field. This course consists of a balance between analysis of current state-of-the-art in the field of soft robotics and project-based design work. We will start with foundation in mechanics of materials and biomaterials by studying the biotic-abiotic interface. From this foundation, we will explore the state-of-the-art in the field of soft robotics, exploring structure-function relationships in soft robotic devices and their applications. In the design portion of the course, students will propose their own novel advances in wearable and implantable soft robotic medical devices.

Learning Management System

This course uses the Learning Management System Canvas: <https://canvas.illinois.edu/>

Textbook and Reading Materials

There is no required textbook. The course will rely on journal articles that can be accessed via the University Library: <https://www.library.illinois.edu/enx/>

Required Equipment

Hands-on project supplies will be provided in class. No additional purchases are required.

Required Software

Assignments may be completed in Word, Powerpoint or Excel which can be accessed via Microsoft Office:
<https://webstore.illinois.edu/shop/product.aspx?zpid=2816>

Late Assignment Policy

Late assignments will incur a 10% penalty per day. After 7 days it is at the discretion of the instructor to accept late work or not. Exceptions to this policy will only be made if a student communicates with the instructor at least 24 hours *in advance* of the original assignment due date.

Assignments and Semester Schedule

All lectures, assignments, due dates, instructions, rubrics can be found on the **Canvas website**.

Final Letter Grades The overall course grade is given on an absolute scale and will not be curved. Concerns about individual assignments or grades should be expressed to the instructor promptly. This course will be assigning +/- letter grades.

- A+ > 97% > A > 93% > A-
- B+ > 87% > B > 83% > B-
- C+ > 77% > C > 73% > C-
- D+ > 67% > D > 63% > D-
- F < 60%

University, College and Course Policies and Practices

Academic Integrity The University of Illinois at 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.

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 BIOE400, 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, attribute, and cite 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 group Canvas page documenting prompts, AI responses, and your usage. Your instructor may ask you to provide this documentation.

You may use generative AI in BIOE498 and 598 for the following:

1. Revising your own text for spelling and grammar
2. Conducting basic research on the course and assignment topics

You MAY NOT use generative AI in BIOE498 and 598 for the following:

1. Generating data for experiments conducted in the course
2. Writing entire sentences, paragraphs, or papers to complete class assignments
4. Solving technical design problems, such as calculating theoretical system responses.

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.

Family Education 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 <http://registrar.illinois.edu/ferpa> for more information on FERPA.

Mental Health 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.

- 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.

*This statement is approved by the University of Illinois Counseling Center

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 (217-333-0050 or <http://odos.illinois.edu/community-of-care/referral/>). 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 Student Assistance Center (SAC) in the Office of the Dean of Students for support and referrals to campus and/or community resources.

Students with Disabilities 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 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 217-333-1970, e-mail disability@illinois.edu or visit the DRES website at <http://www.disability.illinois.edu/>. Here is the direct link to apply for services at DRES, <https://www.disability.illinois.edu/applying-services>.

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 (<https://conflictresolution.illinois.edu>; conflictresolution@illinois.edu; 333-3680) for disciplinary action.

Emergency Response Recommendations Emergency response recommendations and campus building floor plans can be found at the following website: <https://police.illinois.edu/em/run-hide-fight/>. I encourage you to review this website within the first 10 days of class.

Religious Observances Illinois law requires the University to reasonably accommodate its students' religious beliefs, observances, and practices in regard to 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.

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.

Other information about resources and reporting is available here: wecare.illinois.edu.