

Course Syllabus
BIOE 199 FCR: Frontiers in Cancer Research

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Near-peer mentors: Upper-classmen Cancer Scholars

Lecture Location: 0018 Campus Instructional Facility
Hours: Tuesday 5:00-5:50 pm

Catalog Description: Introduction to cancer research. Professional skill development to prepare for undergraduate research, research talks, and interactive discussions on cancer research.

Purpose in CSP: BIOE 199 FCR: Frontiers in Cancer Research provides an introduction to the multidisciplinary field of cancer research and the essential engineering tools used to address challenges in oncology. This seminar-based course focuses on professional skill development, information literacy, scientific paper analysis, team science, and career roadmap building to prepare undergraduate students for participation in faculty research laboratories and the Cancer Scholars Program (CSP).

Student Learning Outcomes: Upon successful completion of the course, students will be able to:

- **Conduct Scientific Literature Searches:** Utilize campus library databases and online repositories to locate relevant peer-reviewed biomedical research publications.
- **Critically Read Scientific Papers:** Analyze complex scientific literature (e.g., *Hallmarks of Cancer*, *Engineering and Physical Sciences in Oncology*) to extract key points, methodologies, and findings.
- **Engage in Multidisciplinary Scientific Discussions:** Participate actively in discussions bridging engineering, biology, medicine, and physical sciences.
- **Understand the Importance of Team Science and Shared Cognition:** Discuss team science frameworks and use visual concept maps (Miro) to map complex problems and recognize complementary team expertise.
- **Formulate a Career & Research Roadmap:** Develop a personalized 4-year Cancer Scholars Program engagement plan and construct an outreach portfolio (lab inquiry email template and professional 1-pager/flyer) to secure undergraduate research positions.

Career Development: Upon successful completion of the course, students will be able to:

- **Communicate Professional Skills and Experiences:** Articulate personal technical skills, academic coursework, and research motivations effectively through tailored written and verbal communication (e.g., laboratory outreach inquiry emails, resumes, and introductory elevator pitches).

- **Build Professional and Academic Networks:** Establish foundational connections with faculty, laboratory research groups, upper-level peer mentors, and/or Cancer Scholars Program (CSP) alumni to foster long-term academic mentorship, informational interviewing, and/or shadowing
- **Conduct Informational Interviews and Shadowing Opportunities:** Initiate and execute professional outreach to clinicians, student and postdoctoral researchers, and faculty to explore translational career pathways, laboratory cultures, and shadowing experiences in cancer research.
- **Synthesize and Summarize Scientific Concepts:** Discuss complex cancer bioengineering concepts with peers.

Required Textbook: none

Academic Conduct: You are expected to behave in a professional and ethical manner. At a minimum, plagiarism or cheating will result in a zero for that assignment. If an individual behaves unethically during the semester, the instructor reserves the right to fail the student. For more information, see the University of Illinois at Urbana Champaign Student Code on Academic Integrity: <https://studentcode.illinois.edu/article1/part4/1-401/>

Campus Emergency Policy: In the event of a major campus emergency, course requirements, deadlines, and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. If an emergency should occur, check Canvas and your Illinois email accounts to learn about modifications to the course.

Fire alarm: Exit the building through the nearest exit. Meet the instructor at the south entrance of Grainger Engineering Library and provide your name to the instructor before leaving.

Tornado: Exit the classroom and proceed quickly yet orderly to the basement. When in the basement, move away from any area open to the upper floors.

Civil unrest: Options: **run** (get out of building if it is safe to do so), **hide** (turn off lights, silence cell phones, remain quiet, and stay out of site), or **fight** (if the first two options will not work, then do what is necessary to increase survival)
<https://police.illinois.edu/em/run-hide-fight/>

Class Attendance: Course attendance is mandatory. However, students who feel ill should go to [McKinley Health](#), email the course instructor with documentation, and not come to class. [Part 5, 1-501 of the Student Code](#) provides additional information, including information on requesting an absence letter.

Participation (30% of grade): Course attendance and engagement in class and mentoring sessions is mandatory. Participation in class and mentoring sessions will be based on student's attendance, interaction during discussions, and engagement in activities and projects.

Mentor meetings (30% of grade): You will be assigned to a small peer-mentoring group led by an upper-level Cancer Scholars student who will serve as a mentor. A weekly one-hour meeting will be scheduled. You are expected to attend and participate in this meeting. During the meeting, you may discuss how to complete assignments for the class, discuss how to become engaged in research, discuss career pathways, etc. The mentor will also facilitate your introduction to other upperclassman Cancer Scholars. If you are unable to attend due to illness or a night exam, please email your mentor with documentation; you may also request (discuss with your mentor who can facilitate) to join another mentor's team for that week to ensure you still get the experience.

Homework/In-class work/Quizzes (25% of grade): Assignments will typically be summaries/reflections of seminars or your thoughts on class topics, and the assignment description and link to submit will be on Canvas. These are intended to support your knowledge growth in cancer research and help you identify the areas of cancer research that interest you.

Homework Guidelines

- All assignments will be submitted electronically via Canvas
- All assignments should follow a specified file name if described in the assignment description
- Deadlines for homework will be specified in Canvas assignments

Final project (15% of grade): At the end of the semester, you will develop a one-page research placement flyer. A template will be provided. This flyer will include information on your research interest and a list of three labs (and specific projects in those labs) in which you are interested. Use this as a plan to engage with faculty in spring semester to find lab placements.

Grading:

Class Participation	30%
Mentor Meetings	30%
Assignments	25%
Final Project	15%
Total**	100%

**Unprofessional behavior may reduce the final grade by up to 5 points per offense—in addition to any other sanctions

Grade Scale:

Letter Grade	Percentage		Letter Grade	Percentage
A+	≥ 97		C+	≥ 77
A	≥ 93		C	≥ 73
A-	≥ 90		C-	≥ 70
B+	≥ 87		D+	≥ 67
B	≥ 83		D	≥ 63
B-	≥ 80		D-	≥ 60

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 regard to their well-being or yours, we encourage you to refer this behavior to the Connie Frank CARE Center (formerly the Student Assistance Center) in the Office of the Dean of Students. You may do so by calling 217-333-0050 or by submitting an [online referral](#). Based on your report, staff in the Student Assistance Center will reach out to offer support and assistance.

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 [Connie Frank CARE Center](#) (formerly the Student Assistance Center) in the Office of the Dean of Students for support and referrals to campus and/or community resources.

Students with Disabilities

The University of Illinois is committed to ensuring that all students, including those with disabilities, do not experience barriers to learning and participating fully in class. If you have a letter of accommodation from DRES and have not already given it to me, please do so as soon as possible to ensure your accommodation needs are met.

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit [1207 S. Oak St., Champaign](#), call [333-1970](#), email: disability@illinois.edu, or go to the [DRES website](#).

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

It is the policy of the University of Illinois Urbana-Champaign to reasonably accommodate its students' religious beliefs, observances, and practices that conflict with a student's class attendance or participation in a scheduled examination or work requirement, consistent with state and federal law. Students should make requests for accommodation in advance of the conflict to allow time for both consideration of the request and alternate procedures to be prepared. Requests should be directed to the instructor. The Office of the Dean of Students provides an optional resource on its [website](#) to assist students in making such requests.

Sexual Misconduct Reporting Obligation

The University of Illinois is committed to combating sex-based misconduct. Faculty and staff members are required to report any instances of sex-based misconduct to the University's Title IX Office. In turn, an individual with the Title IX 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.

Planned Course Schedule

Week	Topic
1	Welcome! Introduction to the course
2	How to read a scientific paper
3	Cancer by the Numbers
4	Investigating Cancer
5	CCIL CRTEC Seminar Series Team Science Event
6	Hallmarks of Cancer
7	CCIL Training & Education Featured Speaker : Claire Schane
8	Engineering and physical sciences in oncology
9	CCIL Training & Education Featured Speaker: Brianna Hajek
10	CCIL Training & Education Featured Speaker: Kun Wang
11	Undergraduate Research Opportunities
12	Investigating Cancer Concepts
13	CCIL Training & Education Featured Speaker: Brett Loman
14	No Class – Thanksgiving
15	Summer Experiences & Spring 2027 Opportunities
16	CRTEC Winter Social & PAIR Partner Feedback

****subject to change****

Classroom Interaction and Community of Care

Our classroom represents a "Community of Care". As members of the Grainger College of Engineering and the University of Illinois Urbana-Champaign, we share the responsibility of fostering a respectful, inclusive, and safe learning environment. Students are expected to engage thoughtfully and respectfully with the varied perspectives, cultures, identities, worldviews, and lived experiences of their classmates. Disagreement and discussion are an important part of learning, but personal attacks, exclusionary or demeaning language, and behavior that persistently disrupts others' ability to participate and learn are not acceptable. Concerns about classroom conduct will be addressed in accordance with course expectations and applicable University policies.

Generative AI Policy

In BIOE 199 FCR, our goal is to develop your original voice, scientific literature literacy, and professional communication skills. Therefore, the use of Generative AI tools (including ChatGPT, Gemini, Claude, and similar models) is strictly regulated:

- **Brainstorming and Concept Mapping [Permitted]:** You may use Generative AI tools to brainstorm possible questions, themes, or approaches. You are responsible for developing the final ideas and connections yourself and for verifying any scientific information using reliable academic sources
- **Writing and Reflections [Prohibited]:** You are not allowed to use Generative AI to write, paraphrase, or draft your weekly reflection statements, scientific summaries, or outreach email templates. All written deliverables must be completely authored by you. Standard spelling and grammar-checking tools are permitted as long as they do not generate or substantially rewrite your text.
- **Restrictions on Course Materials [Mandatory]:** You are strictly forbidden from uploading, pasting, or feeding any course materials, guidelines, speaker slides, or primary papers into Generative AI tools or public databases.

Any unauthorized use of Generative AI will be treated as an Academic Integrity violation under Article 1, Part 4 of the Student Code.