BIOL 320 – Discovering Biological Research Fall 2025

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Class meets: Wednesday & Friday, 8:30 to 9:50 am, in FMH 408

Description: Success in the constantly evolving biological and biomedical sciences necessitates staying current with the latest scientific advances and understanding the processes by which these discoveries are made. This requires competency in skills such as analysis of primary sources, synthesis of information from multiple sources, and critical thinking. This course focuses on these competencies. Students will develop them through a semester-long project during which they will investigate the behind-the-scenes of a scientific study and report on their findings in a long-form written document. This course is a prerequisite for NJIT's Honors Capstone (BIOL 495).

Learning expectations and assessment: This course is designed to introduce students to the process of doing scientific research in biology and the biomedical sciences. This will be achieved through reading and understanding scholarly research, interviewing scientists, and investigating the steps involved in the scientific process, from ideation to publication. During the first half of the course, class meetings will consist of lectures/discussions covering essential aspects of the scientific process and guided exercises and assignments aimed at preparing the students for producing their investigative report. Students are expected to complete all assignments and assigned reading in advance of the class meetings. The second half of the course will focus on producing a document that will tell in layman's terms the story of a recent scientific study, from its inception to its publication.

At the end of this course, students should have the necessary skills to:

1) Read, analyze, and interpret scientific data.
2) Give a compelling presentation of a scientific result or concept.
3) Communicate scientific facts to a non-specialist audience.
4) Find and evaluate scientific literature relevant to their interests and needs.

This course will fulfill the following NJIT Institutional Learning Goals:

1. Research-based Inquiry: Students employ investigative methods
2. Engagement: Students are active and committed learners

It will also fulfill the following Program Learning Goals in Biology:

1. Analyze and interpret in writing scientific information gathered through laboratory, field, and library research.
2. Speak effectively about scientific topics, issues, and problems in formal and informal contexts.
3. Interact with others in a skilled, cooperative fashion to discuss issues and solve problems.

Finally, this course will improve the following NJIT Core Competencies of the Students:

1. Writing, Reading, and Critical Thinking
2. Information Literacy

Planned course outline:

Week 1	Introduction + assignment.
Week 2	- A primer on the scientific process. - How is a scientific idea born?.
Week 3	- How is biological research funded?. - Where does data come from?.
Week 4	- Data representation and analysis. - Academic publishing.
Week 5	- Science communication. - Project warm-up.
Week 6	- Conducting a scientific interview.
Week 7-14	Final project work + weekly project updates.
Week 15	Final project presentation.

The final project is due Monday, December 11.

Office hours: by appointment.

Course prerequisites: HUM 102, R120:201/202, and BIOL 205/206.

Required texts: None.

Optional texts: "Reading Primary Literature: A practical guide to evaluating research articles in biology" by Christopher M. Gillen - ISBN-13: 978-08053-4599-5 ISBN-10: 0-8053-4599-X

Class website: Via NJIT Canvas.

Grading policy:

- Assignments will be graded PASS/FAIL. Project outputs will be graded on a point system.
- All grades for project outputs include active attendance and participation in the drafting, presenting, and feedback/peer-review process.
- I will add 5 points to your grand total if you email me before the first class to confirm that you have read this document.

Grading point breakdown:	
Assignments (8), all are pass/fail	10x8, 80 total
Project warm-up	45 points
Critique of project warm-up	25 points
Interview script	50 points
Final project	100 points
TOTAL	**300 points**

Grading Scale:	
A	88-100%
B+	81-87%
B	74-80%
C+	67-73%
C	60-66%
F	0-59%

Academic Integrity: Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working toward. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at:
http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found violating the code by cheating, plagiarizing, or misusing any online software will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the Code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.

AI use: The use of generative AI to write all or parts of the assignments is strictly prohibited. Using generative AI to replace your thinking is counterproductive to your education and preparation for the professional world. Multiple studies have now demonstrated that the use of generative AI harms learning abilities and the development of critical thinking. **Why would you want that?!** However, using AI for grammar and spell checking, and for self-directed brainstorming is considered an acceptable use of this technology.