

BIOLOGY 630: CRITICAL THINKING FOR LIFE SCIENCE**INSTRUCTORS:** Dr. Eric Fortune (eric.fortune@njit.edu)**OFFICE HOURS:** M,R: 10:30am-11:30am**COURSE SCHEDULE:** M,W: 10:00am-11:20am in CKB 314**COURSE WEBSITE:** <https://canvas.njit.edu/>**OBJECTIVE:**

The goal of this course is to prepare graduate students for academic life. This includes developing skills for effective oral and written scientific communication, collaboration and criticism, and understanding and implementing scientific approaches and methods for the study of biological phenomenon.

OUTLINE AND EXPECTATIONS:

- Each student will choose a topic of research that will be the basis for in class presentations, an original written review paper, and a grant proposal. A cornerstone of these efforts will be the generation of an annotated bibliography of relevant publications.
- Individual assignments include:
 - Identification of 10-15 original research papers that frame the current state of research on a topic.
 - Written description of the significance of the topic.
 - In-class presentations that summarize the field of research related to the topic and individual publications.
 - Written summaries of original research papers and review papers.
 - A written review paper on the chosen topic, including drafts with comments and revisions.
 - Reviews of classmates' works.
 - A grant proposal to continue some aspect of the chosen research topic, consisting of a Summary/Significance section and Specific Aims/Hypotheses
- **Unless otherwise noted, written assignments must be submitted via Canvas/Turnitin.**

REQUIRED TEXT:

None: Be sure to have access to [Canvas](#), login with UCID.

PRESENTATIONS: There will be three presentation categories:

1. Presentations of individual scientific papers.
2. Presentation of the research topic.
3. Presentation of the research proposal.

CLASS PARTICIPATION:

Students are expected to attend every class meeting, participate in discussion and provide feedback and constructive criticism. This is a significant portion of your grade. Do NOT ignore it.

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WRITTEN ASSIGNMENTS:

- **Research Topic Summary:** At the beginning of Week 2, each student will provide a written justification (i.e. significance) of their research topic and a list of 10-15 scientific papers related to the topic. This draft will be returned to you with comments. A second and third version will be due on assigned dates.
- **Summaries:** A summary of an original research paper that includes significance, main highlights of results, methodology (if relevant) and critical thoughts. A set of 2 e-summaries will be due on September 11th.
- **REVIEW PAPER:** Each student will write a paper during the semester based on their topic of discussion in class and the papers they have chosen. Submit the files via email with the exact subject line specifies for that assignment. The draft version (due October 14th).

The paper should consist of:

- Title and Author
- Summary (max 200 words)
- Introduction (Significance and Background)
- Body (divided into sections)
- Conclusions (Review, relevance, new questions)
- References (PubMed)
- Appendix with summaries of key papers

There will be a maximum of 3,500 words (including all the above sections except references and appendix). Papers will be evaluated for plagiarism using Turnitin.

- **PROPOSAL INSTRUCTIONS:** Each student will write a short (2000-2500 words) description of a grant proposal to continue some aspect of the chosen research topic. This proposal will include a Summary section (including Significance) and Specific Aims and/or Hypotheses sections. The draft of the proposal will be due on November 6th.

PEER REVIEW SUMMARIES: Students will provide formal written feedback of both oral and written work. A written review is expected for each in-class peer review.

GRADING POLICY:

GRADE DISTRIBUTION	Percentage
Participation	20%
Presentations	25%
Written Assignments	20%
Review Paper	30%
Grant Proposal	15%
TOTAL	110%

A	90-100
B+	80-89
B	73-79
C+	67-72
C	59-65
F	0-58

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IMPORTANT RULES AND POLICIES

- The [Academic Integrity Code](#) is strictly enforced.
- **Plagiarized assignments will receive an automatic zero grade; the student will receive an F in the course and will be reported to the Dean of Student Affairs.**
- There will be no make-up assignments.
- The grade of assignments/classes missed because of a valid excuse will be determined on a case-by-case basis.

SCHEDULE AND COURSE OUTLINE:

WEEK OF		LECTURE TOPICS	NOTES
Week 1	9/4	Introduction to the course	9/2: Labor Day – No Classes
Week 2	9/9	Lecture: Communication in Science; Selection of papers Lecture: Practical approaches to science	[Draft Reviews]
Week 3	9/16	Student presentations Student presentations	[Peer Feedback on Reviews]
Week 4	9/23	Student presentations Lecture: Research review	[Final Paper Reviews] [Paper Topic & list of references]
Week 5	9/30	Lecture: Relations between research and reporting Student presentations	
Week 6	10/7	Student presentations Student presentations	
Week 7	10/14	Peer review of research papers Student presentations of research topics	[Research draft]
Week 8	10/21	SfN • [Peer editing of research papers] Student presentations of research topics	
Week 9	10/28	Student presentations of research topics Developing and writing a research proposal 1	[Final Research papers]
Week 10	11/4	Developing and writing a research proposal 2 Peer review of proposals	[Proposal draft]
Week 11	11/11	Student presentations of proposals Student presentation of proposals	
Week 12	11/18	Student presentations of proposals [Peer Feedback on Proposals]	
Week 13	11/25	No Class	11/26: Classes follow a Thursday schedule 11/28-12/1: Thanksgiving Recess

Week 14	12/2	Peer review of proposals Final Presentations	[Proposal 2 nd draft]
Week 15	12/9	Final Presentations	[Final Research Proposals] Last Day of classes 12/11

FINAL EXAM WEEK: DECEMBER 14-20, 2019