

BIOLOGY 630: CRITICAL THINKING FOR LIFE SCIENCE

NJIT: BIOL 630 (call numbers 90261) ■ RU: 48:120:630

INSTRUCTOR:	Farzan Nadim (farzan@njit.edu)	OFFICE HOURS:	M,W: 11:30AM - 12:30PM
COURSE SCHEDULE:	M,W: 10:00AM – 11:25AM	COURSE WEBSITE:	http://moodle.njit.edu/

OBJECTIVE:

The goal of this course is to prepare graduate students in understanding the scientific method, reading and critical analysis of scientific literature, and effective oral and written scientific communication in the context of biological sciences.

OUTLINE AND EXPECTATIONS:

- Each student will choose a topic of current research, choose at least 5 original research papers in this topic area, and develop a review paper and a mini grant proposal based upon their topic. This topic could be initially broad and then narrowed down after the paper presentations, but before writing the review paper and mini proposal.
- Individual assignments include:
 - Identification of at least 5 original papers that frame the current state of research on the topic.
 - Written description of the significance of the topic that justifies the choice of topic by the student.
 - In-class presentations that summarize individual papers on the chosen topic
 - A summary of the “Instruction to Authors” section of a scientific review journal, highlighting the important sections of a review paper and what type of information should go into this paper.
 - A written review paper on the chosen topic, including drafts with comments and revisions; a draft of the paper must be submitted three weeks before the final paper is due.
 - Critique of peer papers
 - A mini grant proposal to continue some aspect of the chosen research topic, consisting of a Summary/Significance section and Specific Aims/Hypotheses
 - Grant panel review and scoring of 3-4 peer proposals
- **All written assignments must be submitted via Moodle.**

REQUIRED TEXT:

None: Be sure to have access to Moodle (moodle.njit.edu, 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.

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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.

WRITTEN ASSIGNMENTS:

- **Justification of Research Topic:** At the beginning of Week 2, each student will provide a written justification (i.e. significance) of their research topic and a list of at least 5 scientific papers related to the topic. This draft will be returned to you with comments. A second and, if necessary, third version will be due at assigned dates.
- **Instruction to Authors:** A summary of the “Instruction to Authors” section of a scientific review journal, highlighting the important sections of a review paper and what type of information should go into this paper.
- **Review Paper:** Each student will write one paper during the semester based on their topic of discussion in class and the papers they have chosen. The Review Paper is meant to lead to a hypothesis. The outline of the paper is due a week after the discussion is presented.
 - A draft version will be due on **Sunday, Oct 11**. Submit the files electronically on Moodle in Word format (NOT pdf). The draft must include Title and Author, draft Summary, draft Introduction and highlights of the sections in the Body (see the final version instructions below) and a brief bibliography. In addition, attached as an Appendix, the draft should include a 100-200 word summary of at least three scientific research papers (excluding the ones presented in class) on this topic. These summaries may be in bullet-point format.
 - The final version will be due on **Sunday, Nov 1**. Submit the files electronically on Moodle in Word format (NOT pdf). The paper should consist of:

- Title and Author	- Body (divided into sections)
- Summary (max 200 words)	- Conclusions (leading to a scientific hypothesis)
- Introduction (Significance and Background)	- References (no web page references allowed)
 - There will be a maximum of 3,000 words (including all the above sections except references). For every day a paper is late, 10 points will be deducted. Papers will be submitted via *Turnitin*.
- **Mini Proposal instructions:** Each student will write a short (~1000 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 mini proposal will be due on **Sunday, Nov 29**. Submit the files electronically on Moodle in Word format (NOT pdf).

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CLASS PARTICIPATION:

There will be two peer-review assignments:

- Each student will provide a written critique of one review paper by another student.
- Each student will review 3-4 proposals by other students and provide written and oral critique of these proposals.

GRADING POLICY:

GRADE DISTRIBUTION	
Participation	20%
Presentation	20%
Written Assignments	15%
Review Paper	30%
Grant Proposal	15%
TOTAL	100%

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

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.**
- The use of cell phones and other electronic devices during class or exam times is prohibited. Laptops can be used for taking notes at the discretion of the instructor.
- There will be no make-up assignments.
- Students who miss an assignment due to a valid medical excuse need to provide a doctor's note. The grade of exams missed because of a valid excuse will be determined on a case-by-case basis.

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SCHEDULE AND COURSE OUTLINE:

WEEK OF		LECTURE TOPICS	NOTES
1	8/31	Introduction and outline; Reading and presenting scientific papers; Choosing a topic and justifying the choice	
2	9/7	Student presentation of scientific papers; critical review by class.	9/7: Labor Day – No Classes 9/8: Classes follows Monday Schedule
3	9/14	Student presentation of scientific papers; critical review by class. Topic statement round 1 is due.	
4	9/21	Student presentation of scientific papers; critical review by class. Topic statement round 2 is due.	
5	9/28	Student presentation of scientific papers; critical review by class. Topic statement round 3 is due.	
6	10/5	Student presentation of scientific papers; critical review by class. Highlighted “Author’s Instructions” of a Review Journal is due.	
7	10/12	How to write a paper. Student presentation of research topic; critical review by class. Outline of review paper, including a brief abstract and 3 eNotes, is due.	
8	10/19	Student presentation of research topic; critical review by class. Second outline of review paper and 3 new eNotes is due.	
9	10/26	Student presentation of research topic; critical review by class. Review paper is due.	
10	11/2	How to write a research proposal. Development of the main hypothesis and the Specific Aims. Outline of significance, hypothesis and Specific Aims is due.	
11	11/9	Student presentation of the proposal; critical review by class.	
12	11/16	Student presentation of the proposal; critical review by class.	
13	11/23	Student presentation of the proposal; critical review by class.	11/26: Classes follow a Friday Schedule 11/27-28: Thanksgiving Recess
14	11/30	How to review, critique and score a proposal.	
15	12/7	Student peer review of the research proposals.	

FINAL EXAM WEEK: DECEMBER 15-21, 2015