

BIO 427: Current Topics in Genetics Syllabus

COURSE INFORMATION

Class time: Wednesdays: 5:40 – 8:30 pm, BBH-354

Credit Hours: 3

Course Description: Advanced study and analysis of selected topics within the field of Genetics, with emphasis on topics that are at the forefront of advances in the discipline.

Course Prerequisites: graduate standing

FACULTY INFORMATION

Instructor: Elyse Bolterstein

Office Location: BBH-352A

Office Hours: Wednesday 3:30-5:30, Thursday & Friday 12:15-1:15 or by appointment

Phone Extension: (773) 442-5225

E-mail: E-Bolterstein@neiu.edu

COURSE MATERIALS

List of Required Texts / Materials:

There is no textbook for this class. All reading materials will be available on Desire2Learn, which accessible via NEIUport.neiu.edu or from the NEIU homepage. Select this course to see materials.

COURSE OBJECTIVES / STUDENT LEARNING OUTCOMES

- Summarize main findings presented a scientific paper.
- Critique experiments, analysis, and interpretation presented in scientific literature
- Identify and utilize credible sources of scientific literature
- Lead classmates in discussion of a primary research article
- Develop several novel experimental ideas for a research project in genetics
- Give feedback to classmates in peer reviews
- Present proposed research ideas to your classmates

STUDENT TASKS / ASSIGNMENTS / REQUIREMENTS

Reading assignments: As you move further in your scientific careers, you'll likely find that you obtain most of your information from scientific articles. Similarly, in this class we will be reading mostly primary research articles, along with some review papers, to learn about topics in genetics. Each week you will be responsible for reading 1-2 primary papers along with chosen background information.

Article discussions: We will discuss each of the assigned primary papers in class, which will give everyone ample opportunities to ask questions, clarify important points, and generate even more ideas on the research topic. I will choose papers and lead discussions for the first two-thirds of the semester. For the remainder of the semester, papers will be chosen and class discussion led by groups of 2-3 students. Additionally, each group will generate a list of quiz questions and each person will write a summary of the research paper (see Article Discussion Guidelines for details).

Quizzes: Since discussions will make-up the majority of our class time, it is crucial that all course participants have good understanding of the assigned literature. Therefore, each week you will be asked to complete an online quiz covering articles and reading material assigned for that week. Quizzes will be posted online and are to be **completed by noon each Wednesday**. Each quiz is worth 10 points and I will drop your lowest quiz grade.

Exams: There will be a midterm and final exam for this class largely based on the papers we will read as a class. You will be tested on your knowledge of concepts discussed and your figure interpretation skills.

Research proposal: As graduate students, it is imperative that you develop skills in asking big-picture research questions and creating testable hypotheses to answer those questions. You will further develop these skills this semester by proposing a research question in a genetics topic of your choosing. You will work throughout the semester to create a specific aims page, which would serve as a summary for a grant application on your proposed research. A good specific aims page introduces and provides rationale for an important research question and provides 2-3 different approaches to test the researcher's hypothesis. There will be mini-deadlines throughout the semester to help direct your creative thinking, experimental design, and writing processes.

Peer review: In science, all grants and papers are peer-reviewed meaning that they are read and decided upon by other scientists. In this class, you will become part of this peer review process by reading and critiquing 2 other specific aims pages from your classmates. This exercise will help everyone to gain valuable feedback prior to submission of his/her final draft.

Research proposal presentation: You will present a 10-minute power point presentation on your research questions at the end of the course. This presentation will be based on the ideas in your specific aims page. Presentations will be graded on clarity, organization, and interactions with classmates in a 5-minute Q&A section following your presentation. See presentation guidelines for more details (will be distributed later in the semester).

Paper summaries and in-class assignments: Most weeks I will ask you to prepare a 1-page summary of one of the articles that we will read. This is to help you read the papers and prepare for your chosen article summary later in the semester.

Participation and figure presentation: Science isn't a spectator sport! Since discussion will largely comprise our class time, it's critical that everyone participates. Participation includes, but is not limited to: attending class, asking questions, making comments, clarifying points, providing critiques, and attentive listening. Full points will be awarded to students demonstrating each of these activities during every class.

During each article discussion, you will be the “expert” for one of the figures in the paper. You will describe the experiment performed, figure legend and/or graph axes, results, and interpretation as well as take questions from your classmates (don’t worry if you don’t know all the answers – we’ll also discuss as a class).

Grading Policies and Formulae:

Points	Assignment
100	Quizzes
100	Exam I
100	Exam II
100	Article Discussions
	15 Presentation outline
	15 Quiz questions
	20 Background information
	20 Figure explanation and discussion
	30 Individual paper summaries
100	Research Proposal (Specific Aims)
	5 Research question and hypothesis
	5 Outline and references
	15 Draft 1
	30 Peer reviews (15 pts each)
	25 Final draft
	20 Presentation
50	Paper summaries and in-class assignments
50	Participation (includes figure presentations)
600	Total

Points	Letter Grade
> 89.5%	A
79.5 – 89%	B
69.5 – 79%	C
< 69%	Failing

COURSE POLICIES AND STATEMENTS

Absence Policy:

This is a small course and your participation in class discussion is paramount to its success. While I will not be taking attendance, if you miss a class, you will miss points for figure presentation and participation. If you have to miss class for an approved reason (illness, family emergency, etc.), you must notify me prior to class to be eligible for potential make-up credit.

Academic Integrity Policy:

You are expected to adhere to the University Student Code of Conduct: (<http://www.neiu.edu/university-life/sites/neiu.edu.university-life/files/documents/tfneumei/conductCode.pdf>). This includes a zero tolerance policy on plagiarism: evidence of plagiarism will result in a zero on the assignment and potential failure of the course. If you are unsure of what constitutes plagiarism please talk to me ASAP.

ADA Statement:

Northeastern Illinois University (NEIU) complies with the Americans with Disabilities Act (ADA) in making reasonable accommodations for qualified students with disabilities. Students with special needs should make arrangements with the Student Disability Services (SDS) office to request academic accommodations, located on the main campus in room D104. Contact SDS via (773) 44204595 for <http://www.neiu.edu/university-life/student-disability-services>.

Campus Safety:

Web links to Campus Safety: Emergency Procedures and Safety Information can be found on *NEIUport* on the MyNEIU tab or as follows:
http://homepages.neiu.edu/~neutemp/Emergency_Procedures/MainCampus/.

ADDITIONAL COURSE POLICIES**Course Communication**

All pertinent class communications between the instructor and students is conducted exclusively through NEIU e-mail. It is the responsibility of student to check their NEIU e-mail account for class information and updates. Communication via personal e-mail accounts (eg. @gmail.com) will not be accepted.

Incompletes

An “I” (incomplete) may be given if a student cannot complete the final paper and presentation due to unavoidable circumstances such as illness.

Effective Summer 2008, students will have two semesters (including Summer) after the incomplete grade has been assigned to remove the incomplete. Incompletes that have not been removed within two semesters will be changed to an “F” grade.

Late Work

It is important for your success in this class that you come to each class period prepared to discuss the week’s readings. Therefore late quizzes will not be accepted. Other work will be accepted up to 5 days past the due date, however, late work will receive a 10% penalty for each day it is late (ie. a paper that is 2 days late will be marked down 20%).

Course Outline including due dates for your Research Proposal (RP) and Article Discussion (AD):

Week	Topic	Review Papers	Primary paper/discussion	Due Dates
8/27	Overview		Case study/intro to reading papers	
Intro to Cancer Genetics				
9/3	Oncogenes and Tumor suppressors	<ul style="list-style-type: none"> Croce, C.M. (2008) <i>NE journal of medicine</i>, 358:5 502-11 Rahman, N. (2014) <i>Nature</i>, 505:7483 302-8 	<ul style="list-style-type: none"> Codero, J. et al. (2010) <i>Developmental Cell</i>, 18:6 999-1011 Hom, S. et al. (2013) <i>Science</i>, 339:6122 959-61 	
9/10	Mutations	<ul style="list-style-type: none"> Kennedy, S. et al. (2013) <i>Mechanisms of ageing and development</i>, 133:4 118-26 	<ul style="list-style-type: none"> Alexandrov, L. et al. (2013) <i>Nature</i>, 500:7463 415-21 Vaux, D. (2011) <i>BioEssays</i>, 33:5 341-3 	
9/17	Non-coding RNAs	<ul style="list-style-type: none"> Xue, B. and He, L. (2014) <i>Carcinogenesis</i>, 35:6 1209-1216 	<ul style="list-style-type: none"> Kim, N. et al. (2011) <i>JCB</i>, 195:3 417-33 Chang, C. et al. (2011) <i>Nature cell biology</i>, 13:3 317-323 	
9/24	RecQ helicases: genome guardians	<ul style="list-style-type: none"> Chu, W. and Hickson, I. (2009) <i>Nature reviews: Cancer</i>, 9:9 644-54 	<ul style="list-style-type: none"> Mao, F. et al. (2010) <i>Cancer research</i>, 70:16 6548-55. Sanada, S. et al. (2013) <i>PLoS one</i>, 8:9 e72820 	RP: research question and hypothesis
The Cancer Genome				
10/1	Tumor heterogeneity	<ul style="list-style-type: none"> Burrell, R. et al. (2013) <i>Nature</i>, 501:7467 228-45 	<ul style="list-style-type: none"> Stephens, P. et al. (2012) <i>Nature</i>, 486:7403 400-404 Wu, M. et al. (2010) <i>Nature</i>, 463:7280 545-548 	AD: list of 4-5 possible papers
10/8	Midterm Exam			
10/15	Genomic instability	<ul style="list-style-type: none"> Sánchez-Sorzano et al. (2013) <i>Cell Cycle</i>, 12:1 2016-2023 	<ul style="list-style-type: none"> Dékanty, A. et al. (2012) <i>PNAS</i>, 109:50 20549-54 Hirsch, D. et al. (2013) <i>Cancer research</i>, 73:5 1454-60 	
10/22	Epigenetics	<ul style="list-style-type: none"> Virani, S. et al. (2012) <i>ILAR Journal</i>, 53:3 359-369 	<ul style="list-style-type: none"> Yu, S. et al. (2010) <i>PLoS one</i>, 5:1 e8579 Tang, M. et al. (2012) <i>Frontiers in oncology</i>, 2:197 	RP: outline and references
Students' choice				
10/29	Work day	Work on your group article discussion. Discussion outline and quiz questions due at the end of class.		
11/5	Topic 9			AD: one page summary
11/12	Topic 10			RP: draft for peer revision
11/19	Topic 11			RP: peer revisions
11/26	Work on presentations/peer review (online through D2L)			
12/3	Presentations			RP: power point
12/10	Final Exam			RP: final draft due