

**Special Topics Course:** *Neurogenetics and Behavior, NEURL-UA 302.002*

**Instructor:** Margarita Kaplow

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**Meeting Time:** Tuesday and Thursday 11:00 am-12:15 am – 25 West 4<sup>th</sup> Street, C-8

**Office Hours:** Monday, Wednesday 11:00am-12pm - Meyer 801 or by appointment

**Prerequisites:** *Molecular and Cellular Biology I, INTRONS*

**Co-requisites:** *Behavioral and Integrative Neuroscience, NEURL-UA 220*

**Course Objective:**

Understanding the relationship between genes and behavior will be the primary goal of this course. Students will learn both classic and contemporary genetic tools that are utilized by researchers to study behaviors such as courtship, addiction, memory, sleep and aggressive behavior. The course will focus on learning model systems (fruit flies, nematodes, zebrafish, and mice) amenable to genetic manipulation. The course will also discuss the relationship among genetics, development, and neural circuitry. Through analyzing and presenting primary scientific articles, students will communicate their understanding of neurogenetics. Students will examine research topics that are at the forefront in the field of neurogenetics and behavior.

**Learning Outcomes:**

- 1) To understand the relevance of genetics in studying complex and simple behavior.
- 2) To master critical and analytical skills through the evaluation and critique of scientific literature.
- 3) To learn current genetic techniques applied by scientists to study behavior, neural development and circuitry.
- 4) To gain a comprehensive understanding of a specialized topic in Neurogenetics and Behavior through investigation of scientific literature.
- 5) To articulate the significance of neurogenetics and behavior to the general public through science writing and oral presentations.

**Grading and Evaluation**

Quizzes- 30%

Oral paper presentation- 20%

Writing a review of your scientific paper-20%

Attendance and Class participation-10%

Lab Write Up- 10%

Homework, In Class Assignment -10%

Quizzes- There will be periodic quizzes throughout the course, a total of quizzes. You will be informed in advance when quizzes will take place. Some questions will come from primary scientific articles that we discuss in class. Quizzes will take approximately 15-20 minutes of class time.

Oral presentation- Students will be assigned one scientific article that they will individually present to the class. Presentation will encompass evaluating figures of the scientific article and discussing the significance of the scientific paper. Students will critique the presentation of their peers. The format of the presentation will be discussed in detail during class.

A review of your scientific paper- You will be required to write a one page summary of your assigned scientific paper. Emphasize the significance of the journal article. Write this review as if you are writing a piece for popular press/media. You will have the opportunity to revise your scientific review. 10% of your grade will be from your original draft and 10% of your grade will come from the revised version of your review.

***Review Papers will be due two weeks after you student power point presentation***

Attendance and Participation- Active participation is essential for enriching the learning environment of class. Questions, comments, critiques are welcome in the classroom. Attendance is mandatory. Missing three class lectures will result in a 2% drop in your overall class grade. Missing more than three classes may result in an “unofficial withdrawal”. Please do not be late to class as this is disruptive during presentations and discussions. Students arriving more than 15 minutes late to class will not be permitted to attend class and will be considered absent for the lecture.

Homework- You will be assigned individual (2-3) and one group assignment. The group assignment will be a “mock” grant panel discussion/presentation. We will use some class time to prepare for grant panel discussion.

### **Required reading:**

There will be no required textbook for this course. I will provide review articles and primary research articles on NYU classes which you will be required to read before lecture.

- Intimidated by scientific journal articles? Note the first two weeks of lecture will be dedicated to **C.R.E.A.T.E** (Consider, Read, Elucidate the hypotheses, Analyze and interpret the data, and Think of the next Experiment), a novel pedagogical method for teaching undergraduates the process of analyzing scientific papers.

Lecture	Date	Topic	Reading -Assignment Due
1	9/3/2015	Overview of Course- reviewing basic genetics (Mendelian inheritance)	
2	9/8/2015	C.R.E.A.T.E	Read C.R.E.A.T.E. journal #1 ( hmwk prob#1)
3	9/10/2015	Common genetic tools in fly, nematodes, and vertebrate models (lecture)	Review Papers
4	9/15/2015	C.R.E.A.T.E	Read C.R.E.A.T.E. journal# 2 ( hmwk prob#2)
5	9/17/2015	Neural Development (lecture)	
6	9/22/2015	Continue C.R.E.A.T.E. discussion or Neural Development lecture	<b>QUIZ 1</b>
7	9/24/2015	Student Presentations on Neural Development I	paper #1, paper #2
8	9/29/2015	Student Presentations on Neural Development II	paper #3, paper #4
9	10/1/2015	Neural Function I (lecture)	
10	10/6/2015	Student Presentations on Neural Function I	paper #5, paper #6
11	10/8/2015	Student Presentations on Neural Function I	paper #7, paper #8
12	10/13/2015	<b>NO CLASS</b>	<b>NO CLASS</b>
13	10/15/2015	<b>Lab class, meet in Silver 612 (11-1pm)</b>	
14	10/20/2015	<b>Lab class, meet in Silver 612 (11-1pm)</b>	
15	10/22/2015	Neural Circuits I (lecture)	<b>QUIZ 2</b>
16	10/27/2015	Student Presentations on Neural Circuit I	<i>paper #9, paper #10- lab write up due</i>
17	10/29/2015	Student Presentations on Neural Circuit II	<i>paper #11, paper #12</i>
18	11/3/2015	<b><i>Guest Lecture-Ben Matthews, Lab of Leslie Vosshall, Rockefeller University</i></b>	
19	11/5/2015	Neurogenetics and innate behavior (lecture)	
20	11/10/2015	Student Presentations on Innate Behavior I	<i>paper #13, paper #14</i>
21	11/12/2015	Student Presentations on Innate Behavior II	<i>paper# 15, paper #16</i>
22	11/17/2015	Catch up- Time for Grant panel discussion	<b>QUIZ 3</b>
23	11/19/2015	Complex behavior in invertebrate systems I (lecture)	
24	11/24/2015	Student Presentations on Complex Behavior I	paper #17, paper #18
25	11/26/2015	<b>NO CLASS</b>	<b>THANKSGIVING</b>
26	12/1/2015	More discussion on Complex behavior-(or catch up- grant panel)	<b>QUIZ 4</b>
27	12/3/2015	Student Presentations on Complex Behavior II-(GRANT PANEL in class)	paper #19
28	12/8/2015	The role of genetics in learning and memory (lecture)-	In class time for grant panel
29	12/10/2015	In class grant panel discussion/presentation	<b>GROUP 1</b>
30	12/15/2015	In class grant panel discussion/presentation	<b>GROUP 2</b>