

NEUROBIOLOGY OF DEVELOPMENT BIOL. 449: FALL 2016

Instructor: Laura Cocas, Ph.D.

Course: Mondays and Wednesdays, 12:15-1:30, FA 219

Office hours: Mondays and Wednesdays 10-11, and by appointment, LKH 394

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General Course Objectives:

- To explain and describe the development of the nervous system, how the maintenance and remodeling of neuronal connections occurs, and the experimental approaches used to study neurodevelopment.

This will be measured by online quizzes, in class written short answer questions, as well as in class exams.

- To integrate the concepts learned throughout the class into a broader framework of neural development over time in different organisms.

This will be measured by in class group discussions, in class written short answer questions, as well as in class exams.

- To apply the above concepts to design experiments to test existing and new hypotheses regarding nervous system development and remodeling.

This will be measured by in class group discussions and in class written short answer questions.

- To critically analyze and evaluate the validity of primary scientific literature findings in the field of neurodevelopment.

This will be measured by in class paper discussion assignments as well as online journal article write ups.

- To explain a topic in developmental neurobiology and interpret the significant findings in that topic field to a larger audience of people with mixed scientific backgrounds.

This will be measured by the student presentations of their scientific posters.

Prerequisites: Biology 380 (Cell Biology), Biology 340 (Genetics)

Textbook:

Development of the Nervous System. 3rd Edition. Sanes, D.H., Reh, T.A., Harris, W.A. Academic Press, 2011. You will be expected to review the assigned chapter prior to lecture.

*One copy of the textbook will be available under course reserves in the library. You can check this out for a few hours at a time to read and study if you cannot purchase the textbook.

Other Required Course Materials:

Please bring paper and pen to class every day, and Scantron sheets to exam days.

Lectures: I will lecture using PowerPoint slides, and I will also use a number of other in class and online tools, such as in class assignments and discussions, and online quizzes and assignments. Supporting documents for each chapter can be found on Moodle at:

<https://moodle-2015-2016.calstatela.edu/course/view.php?id=43649>

Course Schedule: Reading

August 22nd	General Course Introduction Intro to Poster Presentation and Short Article Assignments, Small Groups Assigned	Review of Course Structure
August 24th	Neural Induction	1
August 29th	Neural Induction/Polarity	1/2
August 31st	Polarity and Segmentation	2
September 5th No Class		Labor Day
September 7th	Genesis and Migration	3
September 12th	Genesis and Migration	3

September 14th	Paper Discussion Day 1 Form groups (3-4) for poster presentation, add to spreadsheet	Papers on Moodle Article Questions Due 24 hours after class on Turnitin
September 19th	Determination and Differentiation	4
September 21st	Determination and Differentiation	4
September 26th	Axon Growth and Guidance	5
October 3rd	Axon Growth and Guidance	5
October 5th	Paper Discussion Day 2	Papers on Moodle Article Questions Due 24 hours after class on Turnitin
October 10th	Midterm	Chapters 1-5
October 12th	Target Selection	6
October 17th	Target Selection	6
October 19th	Neuron Survival and Death	7
October 24th	Neuron Survival and Death Poster presentation title/topic due	7
October 26th	Paper Discussion 3	Papers on Moodle Article Questions Due 24 hours after class on Turnitin
October 31 st	Synapse Formation	8
November 2nd	Synapse Formation	8
November 7th	Synapse Formation Cont./Refinement	8/9

November 9th	Refinement of Synaptic Connections	9
November 14 th No Class	Work on Poster Presentations in Groups Poster outlines and full bibliography due end of day	N/A
November 16th	Refinement of Synaptic Connections	9
November 21st	Behavioral Development	10
November 23 rd No Class	Thanksgiving Holiday	N/A
November 28th	Behavioral Development	10
November 30th	Paper Discussion Day 4	Papers on Moodle Article Questions Due 24 hours after class on Turnitin
December 5th	Final Exam	Chapters 6-10
December 9th	Poster Presentations	11:20-1:20 (During Final Exam Slot)

* I reserve the right to alter the above topic schedule if necessary.

Grading:

Midterm Exam	100 points
In Class Assignments	120 points
Online Quizzes	100 points
Journal Article Write Ups	160 points (40 each)
Journal Article In Class Presentations	40 points (10 each)

Poster Presentation	80 points
Poster Presentation Participation	20 points
Final Exam	<u>100 points</u>
	720 points total

This point total is an estimate and may not necessarily represent the real outcome, depending on possible changes in assignments, etc.

Moodle: Course assignments, PowerPoint lectures, and all other course materials will be available on Moodle. All assignments will be submitted through Moodle. The Literature Review Outline, Presentation Participation Evaluation, 3 Paper Bibliography, Complete Bibliography, Peer Evaluations of Presentations, and Short Article assignments will be submitted using the Turnitin tab on Moodle. The details for the group assignments (group composition, title) can be submitted using Moodle Database tab. **All assignments must be submitted via Moodle by 5pm.** Online Quizzes are due 24 hours after class (1:30PM the day after the last class for each chapter).*****

Exams: The exams will be a combination of multiple choice and short answer questions- come prepared with pens and scantron sheets. No make-up tests will be scheduled. If evidence of emergency can be provided for a missed final, an Incomplete will be given until the final exam the following semester.

Only **your own** medical emergency or illness will excuse you from an exam. Medical emergencies of relatives, friends, relatives of friends, friends of relatives, weddings, anniversaries, parties, rain, traffic, *etc.* are not valid reasons for missing an exam. They are not valid reasons for asking me to allow you to take an exam during a time other than the scheduled time.

In Class Assignments: To help ensure that everyone understands the material and to reinforce meaningful learning, I regularly daily small in-class written assignments that help facilitate our discussions. We will then work on these questions in small groups of 3; the answers to your questions will be turned in as a group. You will remain in these groups for the entire semester for this assignment. These are worth 10 points and will be given at any time during class, so on-time regular attendance is encouraged. There are no make up possibilities for these points, although I will give approximately 14 total and count 12 for credit, so it is possible to miss 2 and lose no points (or gain 20 extra credit points).

Online Quizzes: Online quizzes for each chapter will include many of the essential concepts. Each quiz will be available online on moodle, and the quiz will close 24 hours after the class covering that material (1:30PM the next day). No exceptions.

Journal Article Assignments: In addition to reading the journal articles assigned, a short written assignment summarizing the major findings of each article will be due by 1pm after EACH of the days of journal article discussion; this is to be turned in via moodle, not on paper in class. Both of these assignments and the articles will be on Moodle. Come to class having read the paper and be prepared to discuss it and take notes.

Paper Discussion Day Attendance: Attendance on the primary literature days is critical. I will be calling on you in class to present your assigned figure, and this is worth 10/50 points for your journal article grade each time.

Poster Presentation Project:

You are to assemble into teams of approx. 4 students (no groups of 2 or 5) and decide on any topic in **developmental neurobiology** that interests you all, and orally present the most cutting-edge research on that topic as a scientific poster during the final exam period. You may choose from the following list or bring another topic to me for approval. At least 3 of your 5 primary references should be current (less than 10 years old), and all 5 should cover cutting-edge research from PRIMARY (peer-reviewed) journal articles. You should have no fewer than 5 primary paper references. You may use books chapters and review articles to help you clarify concepts (but not as a primary source), for a total of at least 8 references. You will prepare one poster on this topic for each group, and a poster session to present the project will be held during the final exam period. Outlines are worth 10 points of your final poster grade and can be a rough sketch of your poster or just a word doc; title and group must be approved by on order to get full points of your final poster grade; only one group member needs to submit these but please include all group member names.

Late work: I will accept, with a valid reason, late assignments, but each day (including late on the day that it is due) 10 points will be subtracted from the total assignment grade. No late exams or quizzes or in class questions will be accepted.

Academic Honesty: Students are expected to read and abide by the University's Academic Honesty Policy, which can be found at www.calstatela.edu/academic/senate/handbook/ch5a.htm. Students who violate this policy will be subject to disciplinary action, and may receive a failing grade in the course for a single violation.

Office hours: To ensure that you will be seen promptly during office hours, please make an appointment with me (note that the Department office is now only making appointments for general advisement, not for class-related advisement).

ADA: Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests accommodation.