NEU 401: CELLULAR AND MOLECULAR NEUROSCIENCE SUMMER 2023 (ONLINE) SYLLABUS

Course Introduction

Welcome to NEU 401, an advanced course on cellular and molecular neuroscience! In this course, we will discover the fundamental cellular and molecular processes that underlie neuronal development, maintenance, and function. In particular, we will explore 9 major questions:

1. What cellular specializations contribute to neuronal function?
2. How do neurons communicate through synapses and what is synaptic plasticity?
3. What unique cellular and molecular mechanisms underlie visual perception?
4. How does the olfactory system detect and encode a nearly unlimited number of odors?
5. How does development ensure the proper wiring and function of the nervous system?
6. What is the role of genetics in nervous system function and sexual behavior?
7. How are our essential functions of eating, drinking, and sleep regulated?
8. What are the underlying causes of neurodevelopmental and neurodegenerative disorders?
9. What techniques are used to study cellular and molecular neuroscience?

Instructor Info

Instructor: Dr. Cameron Prigge (pronounced “Prigga”)
Pronouns: she/her
Email: priggeca@msu.edu
Office Hours: Fridays 2-4pm or by appointment (on Zoom)

About Dr. Prigge: I received my PhD in neurophysiology from Oakland University, where I studied synaptic communication between neurons of the retina. After my PhD, I was a researcher at Duke University for seven years, where I investigated the cellular and molecular basis for neural circuit formation. I enjoyed doing scientific research, but ultimately decided to pursue teaching full-time because teaching students was always my favorite part! I strive to create an inclusive and warm learning environment where every student is encouraged to be themselves and geek out on neuroscience! The success of each student is very important to me, so please reach out if you need additional support. Outside MSU, I enjoy spending time with my family, painting, and playing sports.

Office hours Zoom link: https://msu.zoom.us/j/2806912862
Meeting ID: 280 691 2862 **Passcode:** NEU401

Tips for Success in NEU 401

- **Be prepared.** Complete assigned readings and quizzes prior to coming to class.
- **Ask questions.** If you have a question, there’s a good chance someone else is wondering the same thing! Never assume your question is dumb or naïve. There are no bad questions!
- **Draw it out.** Organizing concepts into diagrams is great way to solidify learning.
- **Challenge yourself.** Dive deeper into topics you’re interested in. Ask questions outside of class. Find out if someone on campus is doing related research and talk to them about their work.

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Course Description

Overview of the cellular and molecular processes that underlie neuronal and circuit function. Topics include synaptogenesis, olfactory and visual systems, developmental wiring, neurogenetics, regulatory systems, and neurodevelopmental and neurodegenerative disorders. Three credits.

Prerequisites

NEU 301 and NEU 302. If you find that you are not proficient in skills and concepts that are needed for you to succeed in this course, please express your concerns with the instructor. They will be happy to refer you to outside resources (e.g. the writing center, tutors, peers, reputable internet resources, readings, etc.) in order to become fully prepared.

Course Structure

For synchronous students, we will meet twice weekly, on Tuesdays and Thursdays, on Zoom from 12:40-2pm. *For asynchronous students*, recorded lectures will be posted on D2L following the synchronous class. Students are welcome to choose either class format and may switch between the two as they prefer.

The course will be organized by weekly modules on D2L. Each weekly module contains the following subsections:

Pre-class materials
Items listed here are required to be completed before class. This section contains the Learning Objectives, which will be the focus of assessments. Items to complete before class may include videos, scientific papers, or other reading. There will be a short quiz on the pre-class material .

In-class materials
Lecture slides will be posted on D2L before class begins. Some days we will have in-class activities that will be posted as material on D2L. We will use Zoom polls, breakout rooms, and Kahoot for activities. Recorded lectures will be posted on D2L following the synchronous session.

Homework
Homework will be assigned each week based on that week's lectures and will be due the following week after our Tuesday class. These worksheets will be your study guides for the exams.

Enrichment
Activities/readings listed here are optional and are entirely for your interest! These materials will NOT be included on assessments.

Course Materials

1. "Principles of Neurobiology" by Liqun Luo. 2nd edition. Print or online edition. Required.

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Course materials will be provided on D2L (Pre-class materials, Quizzes, Homework, Enrichment materials, Lecture Slides and Recordings)

If you need technical assistance at any time during the course or to report a problem, you may:

- Visit the MSU Tech Support Help Site
- Visit the Desire2Learn Help Site
- Call the MSU IT Service Desk at (517) 432-6200, (844) 678-6200, or e-mail at ithelp@msu.edu

Course Schedule

A tentative course schedule for your section is provided on D2L. An accessible version of the schedule in the forms of checklists are also provided on D2L. ***Please note that while it is listed as a full summer session, our last class will be held on Thursday, August 3rd.***

Students are responsible for carefully consulting the schedule regularly, completing the assigned readings and the assignments by their specified dates and times.

If the schedule needs to be modified due to unforeseen circumstances, students will be alerted of changes via email to their MSU account or as a D2L announcement in a timely manner.

Assessments and Grading

12 Quizzes @ 5 pts each
10 Homework assignments @ 20 pts each
4 Exams @ 75 pts each
560 pts total

Quizzes (total number = 12)
Each week there will be a quiz on D2L on the pre-class material. You will have two attempts to take the quiz and your highest grade will be counted. Quizzes are due by 11:59pm the night before Tuesday class. We may substitute surveys for a quiz and they will be graded as credit/no credit.

Homework (total number = 10)
Homework will be assigned each week and due the Tuesday of the following week by 11:59pm. The specific due dates are listed on the schedule. We will not have homework assigned on exam weeks. You may drop your lowest homework score (hence you will be graded on 10 of the 11 assignments).

Exams (total number = 4)
There will be four exams covering three weeks of material each. The quizzes and homework are meant to prepare you for these assessments. Exams will be taken asynchronously on D2L. They will be a combination of multiple choice, short answer, matching, and fill-in-the-blank. On occasion, the instructors may opt to offer limited opportunities to re-attempt certain questions for credit.

Grading scale

Percentage	Grade Point	Percentage	Grade Point
>90%	4.0	70-74.99%	2.0
85-89.99%	3.5	65-69.99%	1.5
80-84.99%	3.0	60-64.99%	1.0
75-79.99%	2.5	<60%	0

Late Passes

Assignments must be turned in on time to receive credit. The exception to this policy is that each student is granted three assignment extensions:

- Two 24-hour extensions
- One 1-week extension

- These extensions may be used only for quizzes or homework assignments, not exams.
- When you upload/submit the assignment to D2L, you must add a note that states “Using one of my (24-hour or 1-week) free extensions”.
- You are also required to send your Instructor an email telling them when you have completed a late assignment, so they are aware that it is ready to grade.

You are advised to save free extensions for an unanticipated event that prevents you from submitting on time. You may not take back a previously used free extension to use again.

Inclusivity

This course will be conducted in an atmosphere of mutual respect and affirms people of all identities. The instructors were provided with a class roster with your name as you provided it to MSU. However, if you prefer to be called a different name than what is on the roster, please let Dr. Prigge know. You are also invited to share your pronouns.

Tardiness/Absence Policies

Attendance at the Zoom lectures is not mandatory. All lectures will be recorded and you are welcome to watch them at your own pace.

Academic Integrity

Our detailed policies on Academic Integrity can be found on D2L. In brief, plagiarism or sharing of course materials will result in an academic dishonesty report (ADR), a failing grade on those materials, and possibly additional sanctions depending on the severity of the offense. You are not allowed to obtain assignments from another student enrolled in the current or a previous semester. All ideas and answers must be original to you. Violations discovered after course completion can result in a grade change for the course, including a failing grade. Publishing course content online without the instructor’s permission is intellectual property theft and academic misconduct and will result in severe penalties.

Please note that this syllabus is a “living document” and is subject to change. If any changes are made you will be informed in class and via email.