

Neurobiology of Disease (NEU 420)
Michigan State University, Spring 2022

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Lectures: Rm 1255 Anthony Hall, Mondays and Wednesdays, 10:20-11:40AM
Office hours: Thursdays, 2:30-4:00 PM, via Zoom, or at ISTB 5014 by appointment

NOTE: Class will be held on-line via Zoom for at least the first three weeks due to MSU-mandated COVID response policy. We will return to in-person class in Anthony Hall as soon as MSU policy allows. Until that time, the Zoom link is:

<https://msu.zoom.us/j/99804490297>

COURSE DESCRIPTION:

This is a one-term lecture course for advanced undergraduate Neuroscience majors. The main focus is to provide an understanding of the systems- and molecular-level mechanisms underlying diseases of the nervous system while comprehending certain experimental procedures that have led to this knowledge. The information will be presented in two ways: 1) lectures delivered by the instructor and 2) presentation and discussion of primary literature from current research programs on some of the diseases. Students will be expected to participate vocally and consistently in paper presentations and discussions.

Prerequisites: NEU 301 or permission of instructor.

COURSE REQUIREMENTS:

Reading:

There will be a variety of journal articles that will be required reading and the subject of in-depth class discussion. There may be additional handouts or reading assignments to accompany the lecture material. There is no textbook for this course.

Examinations:

There will be 2 in-class written exams based on the lecture material. The exams will not be cumulative; however, concepts learned before the first exam may be required to properly answer questions on the second exam. Various types of questions (e.g., multiple-choice, short-answer, fill-ins, and essay questions) will be included. The research articles discussed in class will not be directly tested on the exams, but knowledge of the techniques used in those papers may be required to properly answer exam questions. If you are going to miss an exam, you must contact the instructor before the exam takes place, and you must produce a written excuse from your doctor or the dean's office. If you miss an exam and you do not contact the instructor before the exam, you will receive a

zero (0) for that exam.

Paper Discussions:

Throughout the semester, there will be a number of class days during which there is no lecture, but rather a discussion of a journal article pertaining to one of the diseases we have studied. Individual students will be assigned particular parts of the paper for presentation to the class (i.e., introduction, a figure(s), conclusions/summary). All students will be expected to participate vocally in discussion of each section presented. Grades will be determined based on the clarity and depth of presentation, and on the level and depth of discussion raised by each individual.

ACADEMIC HONESTY:

Article 2.3.3 of the Academic Freedom Report states that "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." In addition, we will adhere to the policies on academic honesty as specified in General Student Regulations 1.0, *Protection of Scholarship and Grades*; the all-University Policy on *Integrity of Scholarship and Grades*; and Ordinance 17.00, *Examinations*. *Therefore, you are expected to complete all exams without assistance from any source. Students who violate MSU rules may receive a penalty grade, including - but not limited to - a failing grade on the assignment or in the course.* Contact your instructor if you have any questions about this policy.

(See <http://www.msu.edu/unit/ombud/honestylinks.html> and/or *Spartan Life: Student Handbook and Resource Guide*)

Behavior that is disrespectful to the instructor or fellow students during class will not be tolerated. This includes exchanging electronic or other notes, web-surfing, talking amongst each other, playing with any electronic gadget, etc.

GRADE DISTRIBUTION:

2 Exams	65% of final course grade (30% + 35%)
Paper Presentations	15% of final course grade
In-Class Vocal Participation	15% of final course grade
Attendance	5% of final course grade

It is critical to note that your in-class vocal participation in discussion is **TRACKED DAILY**. If you do not vocally participate, getting 100% on all other portions of the class will earn you an 85% (3.5 on GPA scale). If you earn less than 100% in all other portions of the class, your maximum grade will be ≤84.4% (≤3.0 on GPS scale).

CLASS SCHEDULE:

Monday, Jan 10 - Session #1

Introduction to course and general background on diseases of the nervous system.

Wednesday, Jan 12 - Session #2
Schizophrenia

Monday, Jan 17
MLK Day, ALL CLASSES CANCELLED

Wednesday, Jan 19 - Session #3
Huntington's Disease

Monday, Jan 24 – Session #4
Paper Discussion – Huntington's Disease

Wednesday, Jan 26 - Session #5
Diseases of the Enteric Nervous System

Monday, Jan 31 - Session #6
Epilepsy

Wednesday, Feb 2- Session #7
Paper Discussion - Epilepsy

Monday, Feb 7 - Session #8
Autism

Wednesday, Feb 9 - Session #9
Addiction I

Monday, Feb 14 - Session #10
Addiction II

Wednesday, Feb 16 - Session #11
Paper Discussion – Addiction

Monday, Feb 21 - Session #12
Post-Traumatic Stress Disorder/Anxiety

Wednesday, Feb 23 - Session #13
Paper Discussion – Anxiety

Monday, Feb 28 - Session #14
Review for Exam

Wednesday, Mar 2 - Session #15
Midterm Exam

Monday and Wednesday, Mar 7&9

Spring Break

Monday, Mar 14 - Session #16

Motor System Diseases

Wednesday, Mar 16 - Session #17

Eating Disorders

Monday, Mar 21 - Session #18

Fragile X Mental Retardation

Wednesday, Mar 23 - Session #19

Paper Discussion - Fragile X Mental Retardation

Monday, Mar 28- Session #20

Traumatic Brain Injury/CTE

Wednesday, Mar 30 - Session #21

Alzheimer's Disease

Monday, Apr 4 - Session #22

Depressive Disorders

Wednesday, Apr 6 - Session #23

Paper Discussion – Depression

Monday, Apr 11 - Session #24

Parkinson's Disease

Wednesday, Apr 13 - Session #25

Paper Discussion – Parkinson's

Monday, Apr 18 - Session #26

Notable Neurology I

Wednesday, Apr 20 - Session #27

Notable Neurology II

Monday, Apr 25 - Session #28

Review for Exam

Wednesday, Apr 27 - Session #29

Final Exam

HONORS OPTION:

To receive an Honors Option for NEU 420, students must achieve a 3.5 overall grade in the class (>84.5%) and complete an additional assignment. Students are required to write a “News and Views” style article based on one of six primary literature presentations made throughout the semester. The format of the article is 2-3 pages, single spaced, extensive citation, and with figures or illustrations optional. The article **should NOT be a summary of the primary literature presentation; no more than one or two short paragraphs should be used to explain the results of the primary article.** Rather, the goal should be to introduce the problems that the primary article is addressing by summarizing the state of the field prior to the work in the primary article, and then to integrate the results of the primary article with the field and speculate as to future studies that may stem from this work. Successful assignments will make copious use of other peer-reviewed primary literature (rather than textbooks or Wikipedia-like sources), and will display a deep understanding of the field and of the interpretations of the primary article. An example of a successful assignment will be provided by the instructor.

The assignment is due on April 27, 2022. However, assignments turned in before April 11, 2022, will be assessed and returned to the student with suggestions for improvement, making successful completion of the assignment **MUCH more likely.**