Seminar in Neuroscience:
Nervous System Injury and Disease
NEUR 411-001: Fall 2021

Instructor: Dr. Gwendolyn (Wendy) Lewis
Instructor e-mail: glewis13@gmu.edu
Course Time: Tuesday 1:30 - 4:10pm
Course Location: Krasnow 229
Credits: 3
Instructor Office: Krasnow 254

TA: Rachel E Keith
TA e-mail: rkeith3@gmu.edu
TA office hours: Friday 1:00pm - 2:00pm via Zoom (for questions about journal entries)

Office Hours: Drop-in office hours are held during the times below. If you are unable to attend a drop-in time, please email me to schedule an appointment.

- **Tuesday & Thursday 11am- 12pm (*in-person*).** On these days I will be in my office, Krasnow Building, room 254.
- **Monday & Wednesday 12pm-1pm (*virtual*).** Drop into the Zoom room to meet https://gmu.zoom.us/j/4952912681

Course Overview:
Most likely, you know someone that has been affected by a nervous system disorder. From Traumatic Brain Injury to Alzheimer's Disease, nervous system disorders affect millions of families and have long fascinated doctors, scientists, and the general public. In this course, we will explore what happens when things go wrong in the nervous system. Specifically, we will explore a wide variety of nervous system disorders, focusing primarily on the cellular and molecular mechanisms at play. We will also examine the history, significance, symptoms, and treatment of these disorders. We will accomplish this through a combination of lectures, student-led presentations and discussions, writing exercises and assignments. This course is designed to develop your skills in reading, analyzing, and interpreting scientific data, while emphasizing practical scientific writing and presentation skills.

This course fulfills the Writing Intensive (WI) requirement for the Neuroscience major. Writing intensive courses are required to assign a minimum of 3500 words, provide constructive feedback on drafts, and allow revision of at least one graded assignment. This course meets and exceeds this requirement through the 500-word news article, 2000-word grant application, and 8x500-word journal entries. Constructive feedback will be given on assignments. You will be able to revise portions of the grant application, based on feedback, before the final assignment is due.

Course Modality
This is an in-person, face-to-face course. There will be no concurrent instruction, meaning the class will not be streamed online and students will not be able to attend virtually. If you are unable to come to class due to illness or other issue, please see the policy under Attendance and Late Work below.

Safe Return to Campus
All students taking courses with a face-to-face component are required to follow the university's public health and safety precautions and procedures outlined on the university Safe Return to Campus webpage (*https://www2.gmu.edu/safe-return-campus*). Similarly, all students in face-to-face and hybrid courses must also complete the Mason COVID Health Check daily, seven days a week. Only students who receive a "green" notification are permitted to attend class. **You will be required to your "green" notification upon entry to class. If you suspect that you are sick or have been directed to self-isolate, please quarantine or get testing. DO NOT ATTEND CLASS IF YOU ARE SICK!**

Students are required to follow Mason's current policy about facemask-wearing. As of August 11, 2021, **all community members are required to wear a facemask in all indoor settings**, including classrooms. An *appropriate facemask* must cover your nose and mouth at all times in our classroom. If

this policy changes, you will be informed. Students who do not have a facemask will be asked to leave the classroom.

Textbook

No textbook is required. Some material in the course was adapted from: Diseases of the Nervous System by H Sontheimer, ISBN:9780128002445.

Learning Goals:

By the end of this course, you should be able to...

- Interpret and analyze primary scientific literature
- Think critically about science and question scientific findings
- Clearly present, explain, and facilitate discussions about scientific data to your peers
- Describe the hallmarks of specific nervous system diseases and explain the cellular and molecular mechanisms involved
- Compare and contrast the mechanisms of different diseases
- Recognize and identify common themes in disease mechanisms
- Examine, analyze, and interpret data from primary literature related to nervous system diseases
- Describe types of disease models and experimental tests used in disease research
- Communicate scientific data for a variety of audiences through translational writing
- Evaluate and critique other's writing
- Develop a unique grant proposal
- Effectively respond to edits and make changes in writing

Course Format:

This course is divided into sections. Each section will begin with a lecture spotlighting a specific disease. After each disease lecture, there will be one or more student-led discussions about scientific journal articles related to the current disease. In preparation for each discussion, every student will write and submit a brief journal entry. There will be 2 additional larger writing assignments. One is a scientific news article, and the other is a mock grant application.

Grading and Assessments:

There are no exams in this course. You will be assessed throughout the course based on a combination of assignments, discussion leading, and participation.

Discussion Leading	15%
Journal Entries	25%
News Article	15%
Grant Application	25%
Participation and Assignments	20%
Total Grade	**100 %**

Grading Scale:

A+ 98-100%	B+ 88-89%	C+ 78-79%	D 60-69%	F 0-59%
A 90-97%	B 80-87%	C 70-77%		

Assignment Details:

Discussion Leading- You will work in groups to lead a detailed presentation and discussion of a primary journal article. The goal of this assignment is to improve your ability to communicate, evaluate, and question the scientific findings of others. The primary journal article will be assigned to you. Additional details will be provided.

Journal Entries- Before each discussion section, you will write a Journal Entry (max 500 words). The goal of these entries is to get you thinking and writing about science on a regular basis. Entries will be written in response to research articles that will be discussed that day. Entries will be submitted in Blackboard and will be graded by the TA with constructive feedback given. Entries are due 1 hour before the beginning of class in which the article will be discussed. The lowest grade will be dropped. One Journal Entry may be revised and resubmitted for full credit, provided the original was submitted on-time. Revised Journal Entries are due by the date set on the syllabus. Instructions will be provided before the first assignment. **You do not need to complete a Journal Entry for the week you lead discussion.**

News Article- You will write a 500-word review of a scientific article, written in the style of a news article. It will be targeted to the general public (i.e. non-scientists). This article should be something that your parents/grandmother/non-scientist can read and understand. This will help you develop translational writing skills that are essential for disseminating scientific information to the public.

Grant Application- Based on previously published data, you will develop a plan for future research and develop an NIH-style grant application. The proposal will be written as though you are a student applying for funding from the NIH to complete the proposed research. The application will be written in the style of a Ruth L. Kirschstein Institutional National Research Service Award (NRSA) from the National Institute of Neurological Diseases and Stroke (NINDS) and will include three essential components of the application: 1) biosketch 2) specific aims, and 3) research strategy. Through this process you will learn what is expected from a real grant application, how to write one, and most importantly, how to describe and promote yourself and your ideas. The complete application will be approximately 2000 words and will serve as a capstone for the course. You will submit a draft of the specific aims before the final due date, which I will return to you with notes for editing. You will also be required to meet with me individually to discuss the project before it is due.

Participation and Assignments- In class participation is vital to your success in this course. The TA and I will be monitoring each student's participation during each class. Attendance is mandatory and included in the participation grade. To receive participation credit, you are expected to arrive on time, be prepared for class, be responsive to questions, participate in discussion sessions, and remain attentive. In order to receive full credit for participation in a discussion session, you must make a meaningful contribution to the discussion, meaning you must talk and your question or comment must represent that you have read the article being discussed. On writing workshop days, you are required to bring a draft of your assignment to class. Up to 5 points of participation credit may be earned per day. Additional assignments and completion grades for drafts will also be factored into this portion of the grade. If you are sick, quarantining, or have an excused absence from class, you will be assigned make-up work to earn your participation grade for that day.

Attendance and Late Work

You are expected to attend class and participate in all discussions and activities. Unexcused absences will result in a 0 for your daily participation credit. Excused absences are given at the discretion of the instructor, and may require a doctor's note or other documentation. E-mailing the instructor before class is highly recommended to obtain an excused absence. Most absences will require make-up work to receive participation credit for the day. Late work will incur a deduction of 20% and is due by the last day of class. Drafts and revisions are not eligible to be turned in late for credit. Late work is not eligible to be revised.

Communication

If you need to contact me, please do so **from your university e-mail account only**. **Include the course name in the subject line and your name in the e-mail**. Check your e-mail and course Blackboard

account daily and before each class meeting. I will use e-mail and Blackboard to communicate with you regarding changes to the course, syllabus, and other essential information. You are responsible for all announcements posted and sent via Blackboard and e-mail, in addition to announcements made in class, regardless of whether or not you are present.

Student Conduct Policies

Be kind and respectful to your classmates. Disruptive, disrespectful, or rude behavior will lead to dismissal from class, a potential deduction of points from the course, and an unhappy me. You will also miss out on all the cool things we do in class!

Cell phones in the classroom: Please silence phones during class and keep them out of sight. Texting is not allowed. I can see you and it's distracting. Cell phone use/ringing (other than for emergency) during class may result in deduction from the participation grade.

Computers in the classroom: Computers are allowed for note taking and course related research only. Failure to observe this rule may result in deduction from the participation grade or loss of computer privileges. It will also make me grumpy.

Academic Integrity

Honesty and integrity are issues at the very core of this course and of science as a whole. George Mason has an honor code with clear guidelines for academic integrity. A few of the most important rules that pertain to this course are as follows: 1) All work submitted must be your own should be done individually unless explicitly stated otherwise. You will be encouraged to discuss ideas, collaborate, and brainstorm with your classmates, but actual assignments need to be completed individually. 2) When referencing the work of others (this includes published and non-published work or ideas), full credit must be given through appropriate citations and references. 3) If you are ever unsure about the rules for an assignment, ask for clarification. Cheating and plagiarism of any form is not tolerated. Plagiarism means using the exact words, opinions, or information from another person without giving the appropriate credit. Any offense will result in a grade of F for the course and will be dealt with in accordance with university regulations.

Disability Accommodations

If you have a documented learning disability or other condition that may affect academic performance you should: 1) make sure this documentation is on file with Office of Disability Services (SUB I, Rm. 4205; 993-2474; http://ods.gmu.edu) to determine the accommodations you need; and 2) talk with me to discuss your accommodation needs.

Mason Diversity Statement*

George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth.

An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals. Diversity is broadly defined to include such characteristics as, but not limited to, race, ethnicity, gender, religion, age, disability, and sexual orientation. Diversity also entails different viewpoints, philosophies, and perspectives. Attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard and respected.

** This is an abbreviated statement, full statement is available at http://ctfe.gmu.edu/professional-development/mason-diversity-statement/*

Privacy and E-mail Use

Students must use their Mason email account to receive important University information, including communications related to this class. I will not respond to messages sent from or send messages to a non-Mason email address.

Student Services

- Learning Services (learningservices.gmu.edu/keeplearning/)
- University Libraries (library.gmu.edu)
- Writing Center (writingcenter.gmu.edu)
- Counseling and Psychological Services (caps.gmu.edu)
- See a longer list of Mason student support services posted on The Stearns Center website.

Add/Drop Deadlines

Deadlines for the Fall 2021 semester can be found on the Mason Academic Calendar page.

Course at a Glance

Nervous System Injury

PNS Trauma

- Lewis and Kucenas. Perineurial Glia are Essential for Motor Axon Regrowth following Nerve Injury (2014)

CNS Trauma

- Mez et al. Clinicopathological Evaluation of Chronic Traumatic Encephalopathy in Players of American Football. JAMA. (2017)

Neurodegenerative Diseases

Alzheimer's Disease

- Tuszynski et al. A phase 1 clinical trial of nerve growth factor gene therapy for Alzheimer disease. Nat Med. (2005)

Huntington's Disease

- Yang et al. CRISPR/CAS9- mediated gene editing ameliorates neurotoxicity in mouse model of Huntington's disease. (2017)

Neurodevelopmental Disorders

Autism Spectrum Disorder

- Tabuchi et al. A Neuroligin-3 Mutation Implicated in Autism Increases Inhibitory Synaptic Transmission in Mice. Science. (2007)

Demyelinating Disorders

Multiple Sclerosis

- Deshmukh et al. A regenerative approach to the treatment of multiple sclerosis. Nature. (2013)

Nervous System Cancers

Glioblastoma

- Bao et al. Glioma stem cells promote radioresistance by preferential activation of the DNA damage response. (2006)

Infectious Diseases

Prion Diseases

- Meyer-Luehmann et al. Exogenous Induction of Cerebral b-Amyloidogenesis Is Governed by Agent and Host. Science. (2006)

Student Choice Topic

TBA

Course Schedule

NEUR 411-001, Fall 2021

Date	Topic	Assignments Due **Due 1 hour before class unless noted* **All assignments submitted to Blackboard unless noted*
Aug 24	• Course Introduction • Lecture: Introduction to Scientific Writing • Activities: Form discussion groups, assign papers, review Journal Entry instructions	• **Syllabus Quiz** (in class)
Aug 31	• Review Discussion Leading instructions • Groups meet • Lecture: PNS Trauma	• **Read Plagiarism and Citation material and take quiz** (in Blackboard) • Read: "How to Read a Scientific Article" and your assigned article • **Journal Entry 1** on assigned article (practice/ completion grade only)
Sept 7	• Discussion: PNS Trauma, (Lewis and Kucenas, 2014) • Lecture: CNS Trauma	• **Journal Entry 2** on PNS Trauma (Lewis and Kucenas, 2014)
Sept 14	• Discussion: CNS Trauma (Mez et al., 2017) • Lecture: Alzheimer's Disease	• **Journal Entry 3** on CNS Trauma (Mez et al., 2017)
Sept 21	• Discussion: Alzheimer's Disease (Tuszynski et al. 2005) • Lecture: Huntington's Disease	• **Journal Entry 4** on Alzheimer's Disease (Tuszynski et al. 2005)
Sept 28	• Discussion: Huntington's Disease (Yang et al. 2017) • Writing a News Article	• **Journal Entry 5** on Huntington's Disease (Yang et al. 2017) • **"Read the News" Assignment**
Oct 5	• Lecture: Autism Spectrum Disorder • News Article Critique	• **News Article Draft Due:** bring 2 printed copies of your draft to class
Oct 12	**No Class: Fall Break (Monday Classes meet Tuesday)**	
Oct 19	• Discussion: Autism Spectrum Disorder (Tabuchi et al. 2007) • Lecture: Multiple Sclerosis	• **Journal entry 6** on Autism Spectrum Disorder (Tabuchi et al. 2007) • **Final News Article Due**
Oct 26	• Discussion: Multiple Sclerosis (Deshmukh et al 2013) • Writing a Grant, Experimental design	• **Journal entry 7** on Multiple Sclerosis (Deshmukh et al 2013) • **Read Harrington Chapter 3 and take Quiz**
Nov 2	• Lecture: Glioma • Specific Aims Critique	• **Specific Aims Draft Due** (upload to Blackboard AND bring 2 printed copies to class)
Nov 9	• Discussion: Glioma (Bao et al. 2006) • Lecture: Prion Diseases	• **Journal entry 8** on Glioma (Bao et al. 2006) • **Sign up for individual meeting**

Nov 16	**No Class**: Individual meetings via Zoom https://gmu.zoom.us/j/4952912681	• Be prepared to explain and discuss your aims in the meeting • **Optional Journal Entry revisions due**
Nov 23	• Discussion: Prion Diseases (Meyer-Luehmann et al. 2006) • Grant Critique	• **Journal entry 9** on Prion Diseases (Meyer-Luehmann et al. 2006) • **Full Grant Draft Due:** bring 2 printed copies of your draft to class
Nov 30	• Writing Exercises • Student Choice Lecture	• Bring a copy of Journal Entry 1 to class (digital or printed) • **ALL LATE WORK DUE** • **Final Grant Due on Thursday Dec 2 at 11:59pm**

NOTE: This schedule is subject to change at any time. **You are responsible for all announcements and syllabus modifications made in class each week whether you are present or not.**
BB = Blackboard