

**Seminar in Neuroscience:
Nervous System Injury and Disease**
NEUR 411-001: Fall 2020

Instructor: Dr. Gwendolyn (Wendy) Lewis

TA: TBA

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Course Format: Online, asynchronous

Credits: 3

Office Hours: All office hours are held in the Blackboard Collaborate Course Room

Instructor Office Hours: Tuesday 9am-10am, Thursday 5pm-6pm and by appointment

TA Office Hours (for questions about Analysis Paper grades/feedback): TBA

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, 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 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 assignment, and 8x600-word Analysis Papers. Constructive feedback will be given on assignments. You will be able to revise portions of the Grant assignment based on feedback before the final assignment is due.

Course Format/Delivery

This course is fully **online and in an “asynchronous” format**, meaning you will NOT be required to log into live virtual sessions. Video lectures will be posted to Blackboard and discussions will take place using discussion boards. Keep in mind that although the course does not meet live, assignments still have firm due dates (see schedule).

This course is divided into weekly lessons. Each lesson will include activities, readings and assignments. Most lessons will begin with a lecture spotlighting a specific disease. After watching each disease lecture, you will read a research paper related to the disease, write an Analysis Paper, and contribute to a discussion board. There will be 2 additional larger writing assignments. One is a scientific news article, and the other is a mock grant application. Toward the end of the semester, you will record a video presentation of one of the research papers we cover this semester.

Blackboard Login Instructions

To access the course blackboard site, log in to mymason.gmu.edu and select the Courses tab. Under the course list, select the current semester (Fall 2020) and click the course number for NEUR-411-001.

Textbook

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

Technology Requirements

Technology information for all Mason Online Course can be found here (<https://masononline.gmu.edu/what-technologies-do-i-need/>).

Hardware

- Windows or Macintosh computer with a fast reliable internet connection
- Recommended screen size of 13in or larger for viewing course material
- Computer speakers or headset to listen to video lectures
- Computer microphone or headset to use with tools like Blackboard Collaborate for office hours
- A webcam (built in or external) for recording presentations using Kaltura
- Enough storage space to download required software and save course materials

Software

- Web browser (see [Blackboard Support](#) for supported browsers). Your browser must be up to date and running the most recent version on Java.
- Kaltura capture software for recording presentations ([Click here for free Kaltura download from Mason](#))
- Adobe Acrobat Reader to view pdf files ([free Acrobat download](#))
- Microsoft Word and Powerpoint ([Microsoft 365 Apps for enterprise available free to students here](#))

Office Hours

Getting help is easy. Live office hours will be held each week using Blackboard Collaborate. To access office hours- log in to the course Blackboard site, click the “Blackboard Collaborate Office Hours” tab, and enter the course room. I will be in the course room **Tuesday 9am-10am, Thursday 5pm-6pm** and by appointment.

Learning Goals

By the end of this course, you will 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

Grading and Assessments

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

Quizzes	10 %
Analysis Papers	25 %
Discussion Board Posts	10 %
News Article	10 %
Grant	25 %
Research Paper Presentation	10 %
Participation and Assignments (drafts, peer critiques, individual meeting attendance, <i>Reading the News</i> assignment)	10 %

Total Grade **100 %**

Grading Scale:

A+ 97-100%	B+ 87-89%	C+ 77-79%	D 60-69%	F 0-59%
A 90-96%	B 80-86%	C 70-76%		

Assignment Details:

Quizzes- You will take a quiz after watching each set of video lectures. Quizzes are open note. The Syllabus Quiz is not timed and can be taken an unlimited number of times. All other quizzes will be timed (usually 20 minutes for 10 questions) and allow 2 attempts.

Analysis Papers- After watching each lecture on a disease topic, you will read a research paper and write a 400-600 word Analysis Paper. The goal of these papers is to get you thinking and writing about science on a regular basis. Analysis Papers will be submitted in Blackboard and will be graded by the TA with constructive feedback given.

Discussion Board Posts- After reading each research paper on the weekly disease topic, we will discuss the topic using a discussion board. You will be required to post to each of these discussion boards 2 times. In the first week of the course, you will post to the “Hello” discussion board 3 times.

News Article- You will write a 500-word review of a primary research paper, written in the style of a news article. It will be targeted to the general public (non-scientists). This assignment will help you develop translational writing skills that are essential for disseminating scientific information to the public.

Grant- Based on previously published data, you will develop a plan for future research and write 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 assignment will include three essential components of a grant: 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 support 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.

Research Paper Presentation- You will record a video presentation of one of the research papers that we read/discuss throughout the course. You will be able to choose which paper you want to present. Details will be provided later in the semester.

Participation and Assignments- Throughout the course there will be several assignments that will be graded for completion and effort. These include drafts for the news article and grant, peer critiques, individual meeting attendance, the group introduction discussion board, and the *Reading the News* assignment.

Policies

Late Work: Late work will incur a deduction of 10% of the earned grade per day. This policy may be modified on an individual basis at the discretion of the instructor.

Extra Credit: An extra credit quiz will be offered at the end of the course. The quiz will be on the student choice topic lectures and will be added to the quiz grade. You can also receive up to 5 points of extra credit by attending a seminar and writing a summary. Information on the Seminar Summary can be found at the end of the Weekly Lessons page in Blackboard. Extra credit will be added to the Participation and Assignments grade at the end of the course. No additional or individual extra credit will be available.

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 body of the e-mail**. Check your e-mail and course Blackboard account daily. 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.

Conduct: Be kind and respectful to your classmates. Disrespectful behavior will lead to a potential deduction of points from the course, and an unhappy me. For a guide to online behavior, see these [core rules for Netiquette](#).

Academic Integrity and Plagiarism: 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. 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 0 for the assignment and possibly a grade of F in the course. Offenses 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 privacy is protected under FERPA (<https://registrar.gmu.edu/ferpa/>).

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 2020 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)

Infectious Diseases

Prion Diseases

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

Student Choice Topic

TBA

Course Calendar
NEUR 411-001, Fall 2020
All due dates are Eastern Standard Time

Weeks	Lessons	Assignments	Due Dates
Week 1 Aug 24- Aug 30	Lesson 1: Introduction	<ul style="list-style-type: none"> • Read Welcome page • Review Syllabus and Course Calendar • Watch Course Introduction Video • Post to the “Hello” Discussion Board forum 3 times • Optional: Post to the “Ask the Instructor” discussion forum if you have questions • Take the Syllabus Quiz • Optional: Meet the Instructor during live office hours Thursday 5pm-6pm 	<p>Due Friday 8/28 11:59pm</p> <ul style="list-style-type: none"> • 1st post to the “Hello” Discussion board <p>Due Sunday 8/30 11:59pm</p> <ul style="list-style-type: none"> • 2nd and 3rd “Hello” Discussion Board Post • Syllabus Quiz
Week 2 Aug 31- Sept 6	Lesson 2: Scientific Writing	<ul style="list-style-type: none"> • Watch Scientific Writing Lecture Videos • Take the Scientific Writing Quiz • Read and Watch Plagiarism materials • Read and Watch Citations and References materials • Take the Plagiarism and Citation Quiz 	<p>Due Friday 9/4 11:59pm</p> <ul style="list-style-type: none"> • Scientific Writing Quiz <p>Due Sunday 9/6 11:59pm</p> <ul style="list-style-type: none"> • Plagiarism and Citation Quiz
Week 3 Sept 7- Sept 13	Lesson 3: Peripheral Nervous System (PNS) Trauma	<ul style="list-style-type: none"> • Watch PNS Trauma Lecture Videos • Take PNS Trauma Lecture Quiz • Read PNS Trauma Paper (Lewis and Kucenas, 2014) • Write Analysis Paper 1 • Post to Lewis and Kucenas, 2014 Discussion Board forum 2 times 	<p>Due Friday 9/11 11:59pm</p> <ul style="list-style-type: none"> • PNS Trauma Lecture Quiz • Analysis Paper 1 • 1st Discussion Board Post <p>Due Sunday 9/13 11:59pm</p> <ul style="list-style-type: none"> • 2nd Discussion Board Post
Week 4 Sept 14 – Sept 20	Lesson 4: Central Nervous System (CNS) Trauma	<ul style="list-style-type: none"> • Watch CNS Trauma Lecture Videos • Take CNS Trauma Lecture Quiz • Read CNS Trauma paper (Mez et al., 2017) • Write Analysis Paper 2 • Post to Mez et al., 2017 Discussion Board forum 2 times 	<p>Due Friday 9/18 11:59pm</p> <ul style="list-style-type: none"> • CNS Trauma quiz • Analysis Paper 2 • 1st Discussion Board Post <p>Due Sunday 9/20 11:59pm</p> <ul style="list-style-type: none"> • 2nd Discussion Board Post
Week 5 Sept 21- Sept 27	Lesson 5: Alzheimer’s Disease	<ul style="list-style-type: none"> • Watch Alzheimer’s Disease Lecture Videos • Take Alzheimer’s Disease Lecture Quiz • Read Alzheimer’s Disease Paper (Tuszynski et al., 2005) • Write Analysis Paper 3 • Post to Tuszynski et al. 2005 Discussion Board forum 2 times 	<p>Due Friday 9/25 11:59pm</p> <ul style="list-style-type: none"> • Alzheimer’s Disease Quiz • Analysis Paper 3 • 1st Discussion Board Post <p>Due Sunday 9/27 at 11:59pm</p> <ul style="list-style-type: none"> • 2nd Discussion Board Post
Week 6 Sept 28- Oct 4	Lesson 6: Huntington’s Disease	<ul style="list-style-type: none"> • Watch Huntington’s Disease Lecture videos • Take Huntington’s Disease Lecture Quiz 	<p>Due Friday 10/2 11:59pm</p> <ul style="list-style-type: none"> • Huntington’s Disease Quiz • Analysis Paper 4

		<ul style="list-style-type: none"> • Read Huntington’s Disease Paper (Yang et al., 2017) • Write Analysis Paper 4 • Post to Yang et al. 2017 Discussion Board forum 2 times 	<ul style="list-style-type: none"> • 1st Discussion Board Post <p>Due Sunday 10/4 11:59pm</p> <ul style="list-style-type: none"> • 2nd Discussion Board Post
<p>Week 7</p> <p>Oct 5- Oct 11</p>	Lesson 7: Writing a News Article	<ul style="list-style-type: none"> • Watch News Article Lecture • Take the News Article Lecture Quiz • Submit <i>Reading the News</i> Assignment • Access your Critique Group site within Blackboard • Post to your Critique Group’s “Introductions” Discussion Board forum • Write and Submit News Article Draft to your Critique Group’s file exchange 	<p>Due Friday 10/9 11:59pm</p> <ul style="list-style-type: none"> • News Article Lecture Quiz • <i>Reading the News</i> Assignment <p>Due Sunday 10/11 11:59pm Within your Critique Group site:</p> <ul style="list-style-type: none"> • Introduction Discussion Board Post • News Article (Draft)- submit to group file exchange
<p>Week 8</p> <p>Oct 12- Oct 18</p>	Lesson 8: News Article Critique	<ul style="list-style-type: none"> • Read and complete a Peer Critique for each of your group member’s News Article Drafts • Edit and submit your final News Article 	<p>Due Wednesday 10/14 11:59pm</p> <ul style="list-style-type: none"> • Peer Critiques for each group member’s news article draft- submit to group file exchange <p>Due Sunday 10/18 11:59pm</p> <ul style="list-style-type: none"> • News Article (Final)
<p>Week 9</p> <p>Oct 19- Oct 25</p>	Lesson 9: Autism Spectrum Disorder	<ul style="list-style-type: none"> • Watch Autism Spectrum Disorder Lecture videos • Take Autism Spectrum Disorder Lecture Quiz • Read Autism Spectrum Disorder Paper (Tabuchi et al. 2007) • Write Analysis Paper 5 • Post to Tabuchi et al., 2007 Discussion Board forum 2 times 	<p>Due Friday 10/23 11:59pm</p> <ul style="list-style-type: none"> • Autism Spectrum Disorder Quiz • Analysis Paper 5 • 1st Discussion Board Post <p>Due Sunday 10/25 11:59pm</p> <ul style="list-style-type: none"> • 2nd Discussion Board Post
<p>Week 10</p> <p>Oct 26 – Nov 1</p>	Lesson 10: Multiple Sclerosis	<ul style="list-style-type: none"> • Watch Multiple Sclerosis Lecture Videos • Take Multiple Sclerosis Lecture Quiz • Read Multiple Sclerosis Paper (Deshmukh et al. 2013) • Write Analysis Paper 6 • Post to Deshmukh et al. 2013 Discussion Board forum 2 times 	<p>Due Friday 10/30 11:59pm</p> <ul style="list-style-type: none"> • Multiple Sclerosis Lecture Quiz • Analysis Paper 6 • 1st Discussion Board Post <p>Due Sunday 11/1 11:59pm</p> <ul style="list-style-type: none"> • 2nd Discussion Board Post
<p>Week 11</p> <p>Nov 2 – Nov 8</p>	Lesson 11: Writing a Grant	<ul style="list-style-type: none"> • Watch Grant Writing Lecture • Take Grant Writing Lecture Quiz • Read Grant assignment sheet and watch video explanation 	<p>Due Friday 11/6 11:59pm</p> <ul style="list-style-type: none"> • Grant Writing Lecture Quiz

		<ul style="list-style-type: none"> • Read the “Specific Aims Draft” Assignment • Review student Grant examples • Write and submit Specific Aims Draft to your Critique Group’s file exchange AND the assignment link 	<p>Due Sunday 11/8 11:59pm</p> <ul style="list-style-type: none"> • Specific Aims Draft (submit to assignment link AND to group file exchange)
<p>Week 12 Nov 9 – Nov 15</p>	Lesson 12: Prions	<ul style="list-style-type: none"> • Watch Prions Lecture Videos • Take Prions Lecture Quiz • Read Prions Paper (Meyer-Luehmann et al. 2006) • Write Analysis Paper 7 • Post to the Meyer-Luehmann et al. 2006 Discussion Board forum 2 times • Sign up for Week 13 Individual Meeting with instructor 	<p>Due Friday 11/13 11:59pm</p> <ul style="list-style-type: none"> • Prions Lecture Quiz • Analysis Paper 7 • 1st Discussion Board Post <p>Due Sunday 11/15 11:59pm</p> <ul style="list-style-type: none"> • 2nd Discussion Board Post • Sign up for your Week 13 individual meeting with Dr. Lewis
<p>Week 13 Nov 16 – Nov 22</p>	Lesson 13: Presentations and Individual Meetings	<ul style="list-style-type: none"> • Read and complete a Peer Critique for each group member’s Specific Aims Draft • Record and Submit Research Paper Presentation • Individual Meetings with Dr. Lewis to discuss your Specific Aims Draft 	<p>Due Friday 11/20 11:59pm</p> <ul style="list-style-type: none"> • 2 Specific Aims Draft Peer Critiques- submit to group file exchange <p>Due Sunday 11/22 11:59pm</p> <ul style="list-style-type: none"> • Research Paper Presentation
<p>Week 14 Nov 23 – Nov 29</p>	Lesson 14: Thanksgiving Recess	<ul style="list-style-type: none"> • Work on your Grant assignment • Have a nice break! 	Nothing is due this week!
<p>Week 15 Nov 30 – Dec 6</p>	Lesson 15: Student Choice Topic	<ul style="list-style-type: none"> • Watch “Student Choice” Lecture Videos • Take the Extra Credit Lecture Quiz! • Finish and submit your Grant assignment 	<p>Due Friday 12/4 11:59pm</p> <ul style="list-style-type: none"> • Extra Credit Lecture Quiz <p>Due Sunday 12/6 11:59pm</p> <ul style="list-style-type: none"> • Grant

NOTE: This schedule is subject to change at any time. You are responsible for all announcements and syllabus modifications posted to Blackboard. Check your Mason e-mail and Blackboard announcements daily.