Seminar in Neuroscience:
Nervous System Injury and Disease
NEUR 411-DL2: Spring 2021

Instructor: Dr. Gwendolyn (Wendy) Lewis
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TA: Farah Bader
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Course Format: Online, hybrid synchronous/asynchronous
Course Meeting Time: Tuesdays 1:30-2:45pm in Blackboard Collaborate Course Room (Zoom as backup)
Credits: 3
Office Hours: All office hours are held in the **Blackboard Collaborate Course Room**
Instructor Office Hours: Thursday 3pm-4pm 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 a hybrid synchronous/asynchronous format**. You will be required to attend 1 weekly synchronous course meeting and complete additional asynchronous work. Asynchronous work, including video lectures, quizzes, and writing assignments will be posted to Blackboard. The weekly synchronous meeting will be used for paper discussions, presentations, lectures, group work, and assignment overviews.

This course is divided into weekly lessons. Each lesson will include activities, readings and assignments. Most lessons will begin with an asynchronous 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 come to the synchronous meeting where we will present and discuss the article. You will also write a news article and a mock grant application.

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 (Spring 2021) and click the course number for NEUR-411-DL2.

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 Courses 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 and Zoom for office hours and synchronous meetings
- A webcam (built in or external)
- 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.
- 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 Course Room" tab, and enter the course room. I will be in the course room **Thursdays 3pm-4pm** 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 %
News Article	10 %
Grant	25 %
Research Paper Presentation	10 %
Participation and Assignments	20 %

(attendance, discussion participation, drafts, peer critiques, individual meeting attendance, *Reading the News* assignment)

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:

Quizzes- You will take a quiz after watching each video lecture. Quizzes are open note. The Syllabus Quiz is not timed and can be take 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. **You do not need to submit an analysis paper the week you do your research paper presentation.**

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 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 work with a group to give a presentation and lead a discussion of one of the papers assigned for class. Your group, the paper you present, and you presentation date will be assigned to you. Your group will need to work together to divide the workload of the presentation and ensure all members understand all parts of the paper. Details will be provided.

Participation and Assignments- Attendance at the synchronous sessions is mandatory. Participation is also required and will be graded. To receive full participation credit, you are expected to arrive on time,

be prepared for class, be responsive to questions, participate in discussion sessions and critiques, and remain attentive. To receive full credit for a discussion session, you must make a meaningful contribution to the discussion with a question or comment. **If you do not talk, bring a draft, or are absent, you will not receive participation credit for the day.** Additional assignments that do not fall under other catagories, such as drafts, will also be included in this grade.

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 for emergencies and extenuating circumstances. You must contact the instructor in advance of the due date to request a modification of the late penalty.

Extra Credit: An extra credit quiz will be offered at the end of the course. The quiz will be on the student choice topic lecture 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, which will be added to the Analysis Paper grade. Information on the Seminar Summary can be found at the end of the Weekly Lessons page in Blackboard. 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 number and section 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 referred to the office of Academic Integrity. 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 Spring 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

- Iaccarino et al. Gamma frequency entrainment attenuates amyloid load and modifies microglia. Nature. (2016)

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

Glioma

- 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 Calendar

NEUR 411-DL2, Spring 2021
All due dates are Eastern Standard Time

Weeks	Topics	Topics and Assignments	Due Dates
Week 1 Jan 25- Feb 1	Introduction & Scientific Writing	Synchronous Meeting 1/26 1:30pm • Introductions • Review of course and syllabus Asynchronous Work • Read Welcome page and Syllabus and Calendar page • Take the Syllabus Quiz • Watch Scientific Writing Lecture Videos • Read and Watch Plagiarism, Citations and References materials • Take the Writing Quiz (covers Scientific Writing, Plagiarism, Citations and References)	Due Monday 2/1 11:59pm • Syllabus Quiz • Writing Quiz
Week 2 Feb 2- Feb 8	Scientific Writing & Peripheral Nervous System (PNS) Trauma	Synchronous Meeting 2/2 1:30pm • Writing exercises • Review analysis paper and paper presentation assignments • Form paper presentation groups, review Blackboard groups • Groups meet Asynchronous Work • Read assigned presentation paper • Write presentation paper summary • Watch PNS Trauma Lecture Videos • Take PNS Trauma Lecture Quiz • Read PNS Trauma Paper (Lewis and Kucenas, 2014) • Write PNS Trauma Analysis Paper	Due Monday 2/8 11:59pm • Presentation paper summary (graded for completion only) • PNS Trauma Lecture Quiz • PNS Trauma Analysis Paper
Week 3 Feb 9- Feb 15	PNS Trauma Discussion & Central Nervous System (CNS) Trauma	Synchronous Meeting 2/9 1:30pm • Groups meet • PNS trauma paper discussion Asynchronous Work • Watch CNS Trauma Lecture Videos • Take CNS Trauma Lecture Quiz • Read CNS Trauma paper (Mez et al., 2017) • Write CNS Trauma Analysis Paper	Due Monday 2/15 11:59pm • CNS Trauma Lecture Quiz • CNS Trauma Analysis Paper
Week 4 Feb 16-	CNS Trauma Discussion &	Synchronous Meeting 2/16 1:30pm • CNS trauma paper discussion	Due Monday 2/22 11:59pm • Alzheimer's Disease Quiz • Alzheimer's Disease

Feb 22	Alzheimer's Disease	Asynchronous Work • Watch Alzheimer's Disease Lecture Videos • Take Alzheimer's Disease Lecture Quiz • Read Alzheimer's Disease Paper (Iaccarino et al. 2016) • Write Alzheimer's Disease Analysis Paper	Analysis Paper
Week 5 Feb 23- Mar 1	Alzheimer's Disease Discussion & Huntington's Disease	Synchronous Meeting 2/23 1:30pm • Alzheimer's Disease paper discussion Asynchronous Work • Watch Huntington's Disease Lecture videos • Take Huntington's Disease Lecture Quiz • Read Huntington's Disease Paper (Yang et al., 2017) • Write Huntington's Disease Analysis Paper	Due Monday 3/1 11:59pm • Huntington's Disease Quiz • Huntington's Disease Analysis Paper
Week 6 Mar 2- Mar 8	Huntington's Disease Discussion & Writing a News Article	Synchronous Meeting 3/2 1:30pm • Huntington's Disease paper discussion Asynchronous Work • Watch News Article Lecture • Take the News Article Lecture Quiz • Submit *Reading the News* 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	Due Monday 3/8 11:59pm • News Article Lecture Quiz • *Reading the News* Assignment Within your Critique Group site: • Introduction Discussion Board Post • News Article (Draft)- submit to group file exchange
Week 7 Mar 9- Mar 15	News Article Critiques & Autism Spectrum Disorder (ASD)	Synchronous Meeting 3/9 1:30pm • NO OFFICIAL MEETING TODAY • I will be in the meeting room to answer questions • Use this time to complete peer critiques (listed under asynchronous work below) • Remaining presentation groups should use this time to meet and work on presentations Asynchronous Work • Read and complete a Peer Critique for each of your group member's News Article Drafts (**Due Tuesday 3/9**) • Edit and submit your final News Article • Watch Autism Spectrum Disorder	**Due Tuesday 3/9 11:59pm** • Peer Critique for each group member's news article draft- submit to group file exchange Due Monday 3/15 11:59pm • News Article (Final) • Autism Spectrum Disorder Lecture Quiz • ASD Analysis Paper

		Lecture videos • Take Autism Spectrum Disorder Lecture Quiz • Read Autism Spectrum Disorder Paper (Tabuchi et al. 2007) • Write ASD Analysis Paper	
Week 8 Mar 16- Mar 22	Autism Spectrum Disorder Discussion & Multiple Sclerosis	Synchronous Meeting 3/16 1:30pm • ASD paper discussion Asynchronous Work • Watch Multiple Sclerosis Lecture Videos • Take Multiple Sclerosis Lecture Quiz • Read Multiple Sclerosis Paper (Deshmukh et al. 2013) • Write MS Analysis Paper	Due Monday 3/22 11:59pm • Multiple Sclerosis Lecture Quiz • MS Analysis Paper
Week 9 Mar 23- Mar 29	Multiple Sclerosis Discussion & Writing a Grant	Synchronous Meeting 3/23 1:30pm • MS paper discussion Asynchronous Work • Watch Grant Writing Lecture • Take Grant Writing Lecture Quiz • Read Grant assignment sheet and watch video explanation • Review student Grant examples • Write and submit Specific Aims Draft to your Critique Group's file exchange AND the assignment link	Due Monday 3/29 11:59pm • Grant Writing Lecture Quiz • Specific Aims Draft **(submit to assignment link AND to group file exchange)**
Week 10 Mar 30 – Apr 5	Grant Critiques & Glioma	Synchronous Meeting 3/30 1:30pm • NO OFFICIAL MEETING TODAY • I will be in the meeting room to answer questions • Use this time to complete peer critiques (listed under asynchronous work below) • Remaining presentation groups should use this time to meet and work on presentations Asynchronous Work • Read and complete a Peer Critique for each group member's Specific Aims Draft (**Due Tuesday 3/30**) • Watch Glioma Lecture Videos • Take Glioma Lecture Quiz • Read Glioma Paper (Bao et al. 2006) • Write Glioma Analysis Paper	**Due Tuesday 3/30 11:59pm** • Peer Critique for each group member's specific aims draft- submit to group file exchange Due Monday 4/5 11:59pm • Glioma Lecture Quiz • Glioma Analysis Paper
Week 11 Apr 6 – Apr 12	Glioma Discussion & Prions	Synchronous Meeting 4/6 1:30pm • Glioma paper discussion Asynchronous Work	Due Monday 4/12 11:59pm • Prions Lecture Quiz • Prions Analysis Paper

		• Watch Prions Lecture Videos • Take Prions Lecture Quiz • Read Prions Paper (Meyer-Luehmann et al. 2006) • Write Prions Analysis Paper	
Week 12 Apr 13 – Apr 19	Prions Discussion	Synchronous Meeting 4/13 1:30pm • Prions paper discussion Asynchronous Work • Sign up for Week 13 Individual Meeting with instructor • Prepare for individual meeting	Due Monday 4/19 11:59pm • Sign up for your Week 13 individual meeting with Dr. Lewis
Week 13 Apr 20 – Apr 26	Individual Meetings	Synchronous Meeting 4/20 1:30pm • Individual Meetings with Dr. Lewis to discuss your Specific Aims Draft (some meetings will not fall during class time) Asynchronous Work • Work on Grant	• Attend Individual Meeting
Week 14 Apr 27 – May 2	Student Choice	Synchronous Meeting 4/20 1:30pm • "Student Choice" Lecture Asynchronous Work • Take the Extra Credit Lecture Quiz! • Work on Grant • Finish and submit your Grant assignment!	Due Sunday 5/2 11:59pm • Extra Credit Lecture Quiz • Final 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.**