Introduction to Neuroscience
NEUR 101-DL1, Spring 2022

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Course Format: Online, asynchronous **in Blackboard**
Credits: 3
Office Hours: Drop-in office hours are held virtually during the times below. If you are unable to attend a drop-in time, please email me to schedule an appointment.

- **Tuesday, Wednesday & Friday 1pm-2pm.** Drop into the Zoom room to meet. https://gmu.zoom.us/j/4952912681

Course Overview

The nervous system controls everything we think, do, and feel. But how does it do this? And what happens when things go wrong? In this course, we will answer these questions by providing an introduction to the study of the brain (neuroscience). We will cover basic concepts in neuroscience such as neurons, action potentials, and synapses and examine their involvement in everyday life. We will explore what neuroscience has already uncovered about human development, aging, and disease. This course is meant serves an introduction to neuroscience for students of all majors.

Mason Core: Natural Science, Non-lab

This is a Natural Science, non-lab Mason Core course. This course aims to enhance your understanding of scientific inquiry by an introducing you to the tools and methods of neuroscience as well as the application of emerging neurotechnologies for personal, medical, and social purposes.

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. Exams and quizzes will be taken in Blackboard. Keep in mind that although the course does not meet live, assignments still have firm due dates (see schedule).

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 2022) and click the course number for NEUR-101-DL1.

Technology Requirements

Hardware

- Windows (10, 8, 7) or Macintosh (OSX 10.10 or higher) 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 Zoom for office hours
- A webcam (built in or external) for taking exams using the Respondus LockDown Browser and Respondus Monitor for exams
- 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.
- Respondus LockDown Browser, (free Respondus download from MyMason)

- 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. Drop-in office hours will be held each week. Office hours are an informal time when you can meet with me without booking an appointment. You can ask questions about the course or we can simply chat about neuroscience. Office hours are held virtually using Zoom. Please log into your Zoom account through Mason https://its.gmu.edu/knowledge-base/how-to-sign-in-to-the-zoom-desktop-application/.

- **Tuesday, Wednesday & Friday 1pm-2pm.** If I am meeting with a student privately, you may be kept in the waiting room until I am finished. I will meet with students in the order they arrive. https://gmu.zoom.us/j/4952912681

If you need help outside of these times, please email me to make an appointment.

Natural Science Core Learning Goals

Natural science learning goals and the course activities that support them are listed below.

- Understand how scientific inquiry is based on investigation of evidence from the natural world, and that scientific knowledge and understanding:
  a) evolves based on new evidence
  b) differs from personal and cultural beliefs
    - Evidence Based Science Unit
    - Neuroscience and Society Project

- Recognize the scope and limits of science.
    - Evidence Based Science Unit
    - Neuroscience and Society Project
    - Neuroethics Unit

- Recognize and articulate the relationship between the natural sciences and society and the application of science to societal challenges (e.g., health, conservation, sustainability, energy, natural disasters, etc.).
    - Neuroscience and Society Project
    - Methods and Emerging Technologies Unit

- Evaluate scientific information (e.g., distinguish primary and secondary sources, assess credibility and validity of information).
    - Evidence Based Science Unit
    - Sources Unit
    - Neuroscience and Society Project

Neuroscience Learning Goals

Neuroscience content-specific learning goals are listed below.

- Describe how the human nervous system is organized from development into adulthood.
- Understand the key mechanisms of brain activity such as action potentials and brain waves.
- Describe how the brain mediates our daily activities from sleep to eating to remembering.
- Appreciate how the nervous system controls complex activities such as movement.
- Understand the basis of key human brain diseases such as Alzheimer's and Parkinson's Disease.

- Find and interpret various types of scientific literature, distinguish the quality of and relevance of sources.
- Evaluate current ethical debates in neuroscience.
- Describe how current technology is used to advance understanding in neuroscience.

Textbook and Materials

No textbook is required. Some material has been adapted from: Larimore, Jennifer L. *Neuroscience Basics: A guide to the brain's involvement in everyday activities.* Elsevier. 2017. ISBN: 0128110163, 978-0128110164. Open educational resources and readings will be provided from various sources.

Grading and Assessments

Quizzes and Activities	25%
Neuroscience and Society Project	15%
Exams (3 Exams)	60%
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%		

Quizzes and Activities: At the end of each weekly lesson, you will take a quiz covering that week's material. Quizzes will be open note. They will be timed (usually 20 minutes for 10 questions) and will allow 2 attempts. After the first attempt, you will be able to see which answers were incorrect. The highest grade will be recorded in the grade center. These are meant to serve as practice for exams. Most weeks there will also be an activity to complete. These could be discussion boards, blog posts, short papers, etc.

Neuroscience and Society Project: The goal of this assignment is to apply your new knowledge of neuroscience to examine a current problem or social issue. Possible problems include:

- Drug and behavioral treatment for mental illness in children (examples: ADHD, anxiety disorders)
- Animal models of human brain disease (examples: Alzheimer's Disease, Schizophrenia)
- Human-machine interface technologies
- Treatment for a nervous system disease
- Genetic testing for brain disease and/or intelligence
- Gene editing to treat brain disease

You will research your topic through primary scientific literature and prepare an informational flyer that defines and examines the problem through the lens of scientific evidence. Further details of the project will be provided.

Exams: There will be 2 regular exams and 1 non-cumulative final exam. These exams may consist of multiple choice, fill in the blank or short answer questions. Exams will be administered through Blackboard using the Respondus LockDown Browser and Monitor. Students will be allowed one 8.5 x 11 sheet of paper notes (front and back) during the exam. You may also use additional blank scrap paper. You may not use other notes, digital resources, or the internet. Exams will be timed.

Policies

Late Work: Late quizzes or assignments will incur a deduction of 20% and are due one week before the end of classes on **Sunday, May 1st**. Work turned in after May 1 will not be accepted.

Make-up Work: Make-up exams may be offered at the discretion of the instructor. Generally, a make-up exam will only be offered in case of emergency or illness and will require documentation. The request for a make-up exam must be submitted before the first day of the exam. Plan to take exams early during the allowable period. Make-ups will not be granted for quizzes or other work.

Extra Credit: You can earn up to 5 points of extra credit by sharing something to the "Cool Stuff" discussion board forum. You can earn 3 points for posting something interesting and neuroscience related to this forum, and 1 point for responding to another students post. Extra credit will be added to the exam 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 using e-mail **from your university account only**. **Include the course name in the subject line and include 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 related 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: 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 follow: 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. 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 be reposted to the academic integrity office and 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 MasonLive 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 2022 semester can be found on the Mason Academic Calendar page.

Course Calendar

NEUR 101- DL1 Spring 2022

All due times are in Eastern Standard Time (EST)

Week	Lessons	Assignments	Due Dates
Week 1 Jan 24- Jan 30	Introduction	• Read Welcome page • Review Syllabus and Course Calendar • Watch Course Introduction Videos • Week 1 Activity- Post to the "Welcome" Discussion Board (1 post and 2 comments) • Watch *What is Neuroscience?* Lecture Videos • Take the Week 1 Quiz • Optional: Post to the "Ask the Instructor" Discussion Board forum	Due Sunday 1/30 11:59pm • Week 1 Activity- "Welcome" Discussion board post and comments • Week 1 Quiz
Week 2 Jan 31- Feb 6	Cells & Development	• Watch/Read *Cells of the Nervous System* Material • Watch /Read *Building a Brain: Development* Material • Do Week 2 Activity • Take the Week 2 Quiz	Due Sunday 2/6 11:59pm • Week 2 Activity • Week 2 Quiz
Week 3 Feb 7- Feb 13	Organization of the Nervous System & Action Potentials and Synapses	• Watch/Read *Organization of the Nervous System* Material • Watch/Read the *Action Potentials and Synapses* Material • Do Week 3 Activity • Take the Week 3 Quiz	Due Sunday 2/1311:59pm • Week 3 Activity • Week 3 Quiz
Week 4 Feb 14- Feb 20	Scientific Principles: Evidence-Based Science	• Read *What Makes Everyday Scientific Reasoning So Challenging?* By Shah et al., 2017 • Watch *Scientific Principles: Evidence-Based Science* Lecture • Do Week 4 Activity • Take Week 4 Quiz • Take the Respondus Test Quiz (to ensure Respondus is working for next week's exam)	Due Sunday 2/20 11:59pm • Week 4 Activity • Week 4 Quiz • Take the Respondus Test Quiz
Week 5 Feb 21- Feb 27	Exam 1	• Prepare for Exam 1 • **Take Exam 1 (Open Monday 12:00am – Sunday 11:59pm)**	Due Sunday 2/27 11:59pm • Exam 1
Week 6 Feb 28- Mar 6	The Senses	• Watch/Read *The Senses Part 1* and *The Senses Part 2* Material • Do Week 6 Activity • Take Week 6 Quiz	Due Sunday 3/6 11:59pm • Week 6 Activity • Week 6 Quiz

Week 7 Mar 7- Mar 13	Movement & Stress	• Watch/Read the *Movement* Material • Watch/Read the *Stress* Material • Do Week 7 Activity • Take Week 7 Quiz	Due Sunday 3/13 11:59pm • Week 7 Activity • Week 7 Quiz
Week 8 Mar 14- Mar 20	Spring Break	• Enjoy the Break!	Nothing is Due
Week 9 Mar 21- Mar 27	Scientific Principles: Sources & Neuroscience and Society Project Intro	• Watch/Read the *Scientific Principles: Sources* Material • Read the Neuroscience and Society Project guidelines • Watch the *Neuroscience and Society Project* Video Description • Do Week 9 Activity • Take Week 9 Quiz	Due Sunday 3/27 11:59pm • Week 8 Activity • Week 8 Quiz
Week 10 Mar 28 – Apr 3	Emotion, Blood, Feeding and Motivation	• Watch/Read the *Emotion* Material • Watch/Read the *Blood and Barriers* Material • Watch/Read the *Feeding and Motivation* Material • Do Week 10 Activity • Take Week 10 Quiz	Due Sunday 4/3 11:59pm • Week 9 Activity • Week 9 Quiz
Week 11 Apr 4 – Apr 10	**Exam 2**	• Prepare for Exam 2 • **Take Exam 2 (available Monday 12:00am – Sunday 11:59pm)**	Due Sunday 4/10 11:59pm • Exam 2
Week 12 Apr 11 – Apr 17	Learning and Memory & Sleep and Circadian Rhythms	• Watch/Read the *Learning and Memory* Material • Watch/Read the *Sleep and Circadian Rhythms* Material • Do Week 12 Activity • Take Week 12 Quiz	Due Sunday 4/17 11:59pm • Week 11 Activity • Week 11 Quiz
Week 13 Apr 18 – Apr 24	Scientific Principles: Methods, Emerging Technology, and Neuroethics	• Watch/Read the *Scientific Principles: Methods and Emerging Technologies* Material • Watch/Read the *Scientific Principles: Neuroethics* Material • Do Week 13 Activity • Take Week 13 Quiz	Due Sunday 4/24 11:59pm • Week 12 Activity • Week 12 Quiz
Week 14 Apr 25 – May 1	Injury and Disease	• Watch/Read the *Injury and Regeneration* Material • Watch/Read the *Neurodegenerative Diseases* Material • Submit Neuroscience and Society Project • Take Week 14 Quiz	Due Sunday 5/1 11:59pm • Week 13 Quiz • **Neuroscience and Society Project** • **All Late Work Due**

Week 15 May 2- May 8	Student Choice	• Watch/Read Student Choice Material • Take Week 15 Quiz • Study for Exam 3	Due Sunday 5/8 11:59pm • Week 15 Quiz
Exam 3 (non-cumulative): Open Monday 5/9 12:01am – Friday 5/13 11:59pm			

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.**