Introduction to Neuroscience (NEUR 101)

"Anyone who thinks that scientists can't be artists need look no further than Dr. Greg Dunn and Dr. Brian Edwards. The neuroscientist and applied physicist have paired together to create an artistic series of images that the artists describe as "the most fundamental self-portrait ever created." Literally going inside, the pair has blown up a thin slice of the brain 22 times in a series called *Self-Reflected*." https://mymodernmet.com/self-reflected-brain-scientific-art/

George Mason University

Fall 2020 Section 002 Hybrid: Online and In-person Activities.

Meeting Face to Face David King Jr. Hall 1006 Th 10:30am – 11:45am.

Instructor: Greta Ann Herin, Ph.D. Term Assistant Professor, Interdisciplinary Program in Neuroscience.
Email: gherin@gmu.edu
Office hours: W 12:30pm-1:30pm, also by appointment during business hours.

8/31	Last day to add classes
9/8	Last day to drop classes without penalty
9/15	Last day to drop (50% tuition penalty)
9/16-6/28	Selective withdrawal period

Course Description

Face to face course. Portions of this syllabus are taken or modified from my colleague Dr. Wendy Lewis.

(from the GMU catalog): This course is for students interested in the science of the brain from its evolutionary origins to its role in health and behavior. We examine systems that make up the brain from neurons to circuits. We explore trends in neuroscience experimentation including neuroimaging, computational neuroscience and neuropharmacology. Offered by Neuroscience. Limited to three attempts.

Mason Core: is a Natural Science, non-lab Mason Core course

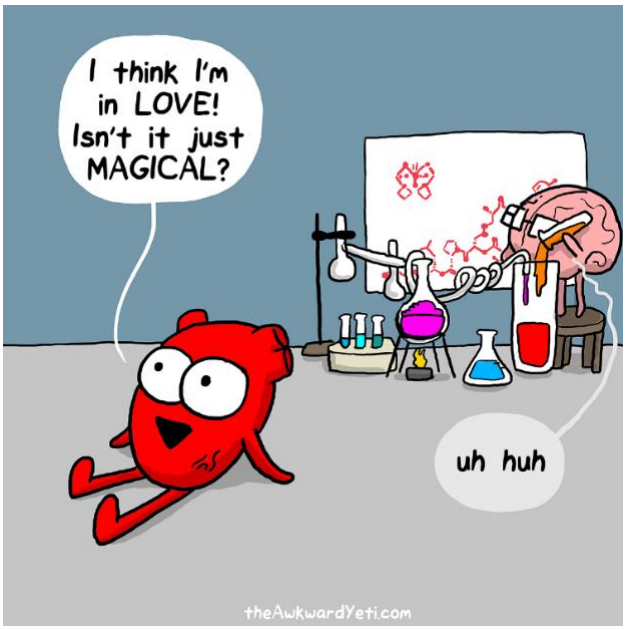
Grading: This course is graded on the Undergraduate Regular scale.

Blackboard Login Instructions

Access to MyMason and GMU email are required to participate successfully in this course. Please make sure to update your computer and prepare yourself to begin using the online format BEFORE the first day of class. Check the IT Support Center website. Navigate to the Student Support page for help and information about Blackboard. In the menu bar to the left you will find all the tools you need to become familiar with for this course. Take time to learn each. Make sure you run a system check a few days before class. Become familiar with the attributes of Blackboard and online learning.

Required Textbooks

No Textbook Required



Course Learning Outcomes

Natural Science Core Learning Goals After completion of this course, students will be able to:

1. Understand how scientific inquiry is based on investigation of evidence from the natural world, and that scientific knowledge and understanding.
    - evolves based on new evidence
    - differs from personal and cultural beliefs
2. Recognize the scope and limits of science.
3. 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.).
4. Evaluate scientific information (e.g., distinguish primary and secondary sources, assess credibility and validity of information).

Neuroscience specific learning goals After completion of this course, students will be able to:

5. Describe how the human nervous system is organized from development into adulthood.
6. Understand the key mechanisms of brain activity such as action potentials and brain waves.
7. Describe how the brain mediates our daily activities from sleep to eating to remembering.
8. Appreciate how the nervous system controls complex activities such as movement.
9. Understand the basis of key human brain diseases such as Alzheimer's and Parkinson's Disease.
10. Find and interpret various types of scientific literature, distinguish the quality of and relevance of sources.
11. Evaluate current ethical debates in neuroscience.
12. Describe how current technology is used to advance understanding in neuroscience.

Technology Requirements

Hardware: You will need access to a Windows or Macintosh computer with at least 2 GB of RAM and access to a fast and reliable broadband internet connection (e.g., cable, DSL). A larger screen is recommended for better visibility of course material. You will need speakers or headphones to hear recorded content and a headset with a microphone is recommended for the best experience. For the amount of Hard Disk Space required taking a distance education course, consider and allow for:

1. the storage amount needed to install any additional software and
2. space to store work that you will do for the course.

If you consider the purchase of a new computer, please go to Patriot Tech to see recommendations.

Software: We use Blackboard as the learning management system. You will need a browser and operating system that are listed compatible or certified with the Blackboard version available on the myMason Portal. See supported browsers and operating systems. Log in to myMason to access your registered courses. Some courses may use other learning management systems. Check the syllabus or contact the instructor for details. Online courses typically use Acrobat Reader, Flash, Java, and Windows Media Player, QuickTime and/or Real Media Player. Your computer should be capable of running current versions of those applications. Also, make sure your

computer is protected from viruses by downloading the latest version of Symantec Endpoint Protection/Anti-Virus software for free here.

Students owning Macs or Linux should be aware that some courses may use software that only runs on Windows. You can set up a Mac computer with Boot Camp or virtualization software so Windows will also run on it. Watch this video about using Windows on a Mac. Computers running Linux can also be configured with virtualization software or configured to dual boot with Windows.

Note: If you are using an employer-provided computer or corporate office for class attendance, please verify with your systems administrators that you will be able to install the necessary applications and that system or corporate firewalls do not block access to any sites or media types. We will not have any course-specific software other that what is necessary to participate in web-based activities.

Course Schedule Please see schedule in PDF format on Bb

Assignments Description: How will we achieve our learning objectives?

1. Unit Exams: There are 5 unit exams. You will have two attempts for each exam. The highest score will be your grade for that exam. You will have 1 hour to complete the exam during the class period. More details about the format of the exams will be given in class.

2. Online Discussion Board Posts Your discussion will be graded based upon the rubric, which looks to quality, timeliness, responsiveness, and moving the discussion forward. You are expected to participate throughout the week in the discussions -not clump them all together on one day (see rubric).

Each of you should make a minimum of one response addressing the key question (no later than Monday 10:00 pm) AND then also make a minimum of two additional comments as responses made to your classmates (no later than Thursday 10:00 PM). You will be given online discussion participation points based on the quality of your responses.

3. **Final Exam Essay** The final exam will be essay in nature addressing big picture questions in neuroscience such as structure function relationships, analysis across analytical levels, underlying causes of diseases, and applying the scientific process. Essay questions will be given in advance of the exam and you are free to ask for coaching from the professor in preparation for the exam. Essay question answers must be in your own words or properly cited and you must work alone on these.

4. **Literature analysis project**

In this project, you will work in groups and your group will be given a potential treatment for a neurodegenerative disease. The treatment may be real or fictitious. You will work with the group to analyze current literature and determine the likelihood that the treatment will work. More details will be given in Bb.

5. **Participation points** You will be awarded points for each time interact to positively impact the learning environment by asking questions in class on the topic, answering questions on the topic not otherwise counted for discussion board points, etc. These points are at the discretion of the instructor. More information is posted on Bb under "How can I earn participation points?".

Graded Activities

Activity	Number	Points each	Points total	Percent of Total Grade
Discussion Posts	5	10	50	6.25
Discussion Replies	10	5	50	6.25
Unit Exams	5	100	500	62.5
Final Essay	1	50	50	6.25
Literature Analysis Project	1	100	100	12.5
Participation points	5	10	50	6.25
Total			800	100

Grade Distribution (Table at right)

A	93-100	C	72-77.9
A-	90-92.9	C-	70-71.9
B+	88-89.9	D+	68-69.9
B	82-87.9	D	62-67.9
B-	80-81.9	F	0-61.9
C+	78-79.9		

Course Policies

Late Assignments: All assignments must be turned in on the due date given on the assignment sheet. Late assignments are subject to a 20% penalty.

Instructor-Student Communication: I will respond to your emails within 48 business hours. If I will be away from email for more than one business day, I will post an announcement in the Blackboard course folder. Before sending an email, please check the following (available on your Blackboard course menu) unless the email is of a personal nature:

1. Syllabus
2. Discussion board topic on general course questions.
3. On-demand Blackboard videos on how to use Blackboard features, and Technical Requirements.

Feel free to respond to other students in the Discussion board topic on general course questions forum if you know the answer.

University Policies and Resources

a. Academic Honesty: You are expected to be familiar with and abide by the University's Honor Code. The Code can be found here. It is your responsibility to see me if you have questions about these policies. All of the honor code must be followed in this course, but a few of the most important rules that pertain to this course are as follows:

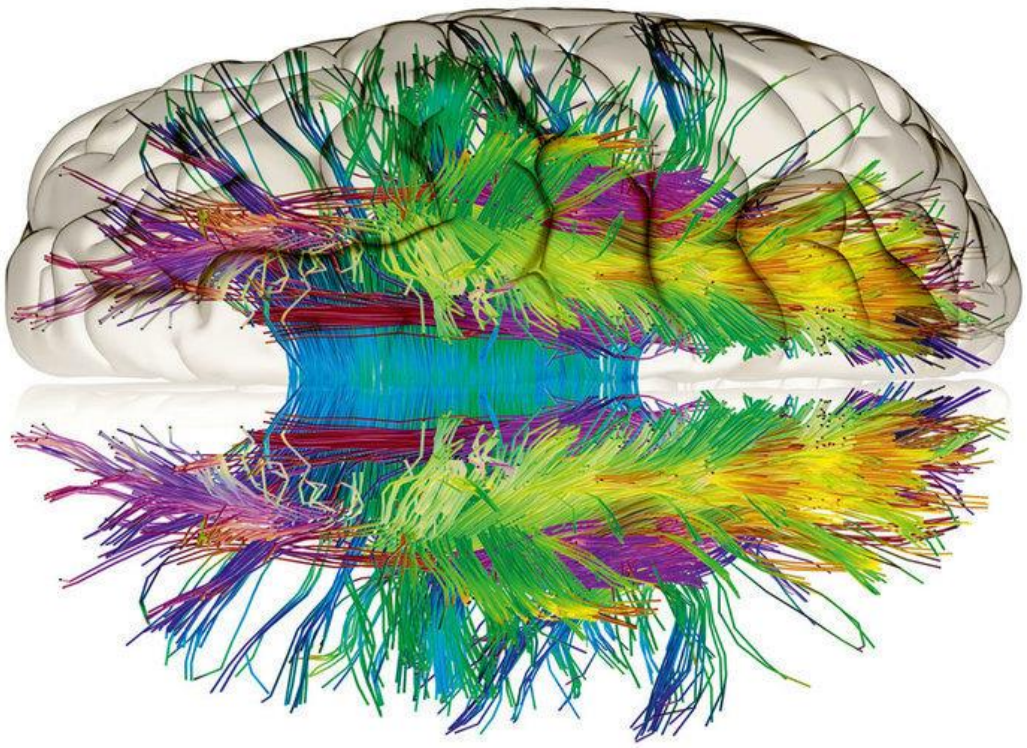
    a. All work submitted must be your own should be done individually unless explicitly stated otherwise. You will be encouraged to discuss ideas, collaborate, and brainstorm with your classmates, but actual assignments need to be completed individually.
    b. When referencing the work of others (this includes published and non-published work or ideas), full credit must be given through appropriate citations.
    c. 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.

b. Students must follow the university policy for Responsible Use of Computing
c. Student services: The University provides range of services to help you succeed academically and you should make use of these if you think they could benefit you. I also invite you to speak to me (the earlier the better).
d. Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
e. The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance. Counseling Center: Student Union I, Room 364, 703-993-2380.
f. Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester. All

academic accommodations must be arranged through that office. Please note that accommodations MUST BE MADE BEFORE assignments or exams are due. I cannot adjust your grade after the fact.

g. Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.
h. The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing. University Writing Center: Robinson Hall Room A114, 703-993-1200. The writing center includes assistance for students for whom English is a second language.

i. Diversity: 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.



https://www.mpg.de/12035093/brain This figure shows the distribution of white matter from one hemisphere to the other and within each hemisphere.