

Introduction to Neuroscience
NEUR 101-003: Fall 2021
Hybrid: Online and In-person Activities

Instructor: Dr. L. Ren Guerriero (they/them)
Their email: lguerrie@gmu.edu
Meeting times: Tuesdays at 10:30-11:45am
Meeting location: Horizon Hall, room 3008
Office Hours: Thursday 10:30am-11:45
Office Location: Krasnow 253, [Zoom](#)

What is this class?

(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."

This course is a **Natural Science, non-lab Mason Core course**. This means you will:

- 1) 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
- 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).

What will I get out of this neuroscience class?

Our nervous system drives and inspires us, allows us to think and read, sleep and dream, move and groove, and so much more. This course is designed to introduce you to basic neuroscience with a focus on humans and current topics in the field. You will be able to:

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

How do I do well in this class?

Technology:

Because this is a hybrid course, introduction to topics will be done using online materials posted on BlackBoard. There will be readings and videos that you must view before coming to class

on Monday. 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 2021) and click the course number for NEUR-101-003.

Preparation:

This is a 3-credit hour course, which is expected to about 8-9 hours of course work. Since we only meet for one hour in person, there will be online material that needs to be reviewed throughout the week. You must complete the assigned materials before coming to class. This will usually consist of viewing videos, reading articles, and/or visiting websites.

What are our responsibilities during class (Code of Conduct)?

(This section will be workshopped during the first day of class, voted on, and added here.)

Student Responsibilities:

Instructor/TA Responsibilities:

Example COVID Policies: 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. The COVID Health Check system uses a color code system and students will receive either a Green, Yellow, or Red email response. Only students who receive a "green" notification are permitted to attend courses with a face-to-face component. If you suspect that you are sick or have been directed to self-isolate, please quarantine or get testing. Faculty are allowed to ask you to show them that you have received a Green email and are thereby permitted to be in class.

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.

How will I be graded this class?

We will be using the standard undergraduate 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%		

Weekly Quizzes and Activities– Each week's lesson will end with a quiz covering that material. This will be open note, but 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 higher grade will be recorded. These are meant to help you study materials and practice for exams. Most weeks there will also be an activity to complete.

Neuroscience and Society Project – This assignment will challenge you to apply your neuroscience knowledge to examine a current problem or social issue. 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. Possible problems include:

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

- Gene editing to treat brain disease

Exams – There will be 2 regular exams and 1 non-cumulative final exams. These may consist of multiple choice, fill in the blank, or short answer.

Final Exam – If you have an A in the class before finals week, you can choose to not take the final exam. This **will reduce the total number of points** you can earn in the class, but ultimately will not change your letter grade.

I missed class or an assignment, what do I do?

Life is unpredictable and illness (both physical and mental) should be taken seriously. If you know you will not be in class, email Dr. Guerriero. Holidays, illnesses, and university sanctioned events likely count as an excused absence, but only if you notify Dr. Guerriero either before the event or as soon as you decide you're too ill to come to class. Next, if you miss class, look at Blackboard for the information covered in class. If the article doesn't make sense to you, email Dr. Guerriero. If the slides are confusing, email Dr. Guerriero.

Missed Assignments

- "Life Happens Pass" – For one written assignment this semester you can get an automatic 48-hour extension on the due date, no questions asked. **You must inform Dr. Guerriero in writing (email) to get this pass.**
- All other missed assignments will get a 10% deduction per day of being late. It is to your benefit to turn in assignments late. Most of the points are better than no points!

I'm struggling in this class. How do I get help?

- I don't understand the class material, assignments, my grades – email Dr. Guerriero. When emailing me, you have to use your gmue.edu email account or I cannot verify that the email came directly from you.
- I'm stressed, anxious, angry, or mentally unwell – [Counseling and Psychological Services](#) have drop-in hours or virtual services, including a text line, online chat, and video chats. If its outside business hours, they have an after-hours crisis counselor (call 703-993-2380 and selection option 1).
- I need help with time management, note taking, or other study skills – Talk to Dr. Guerriero or reach out to [Learning Services](#) for a personalized appointment and online tools.
- I'm struggling with social issues that impact my identity, my culture, or me personally – College and higher education is inherently exclusionary, racist, sexist, and classist, and I'm committed to helping change that. Mason is also committed to this, with lots of resources:
 - o [Center for Culture, Equity, and Empowerment](#) (includes a bias incident reporting form)
 - o [First-Gen+ Center](#) (resources for first-generation, undocumented, refugee, and limited income students)
 - o [LGBTQ+ Resources Center](#) (including crisis, community, and gender transition resources)
 - o [Student Support and Advocacy Center](#) (resources for financial help, sexual and interpersonal violence support, and drug/eating disorder recovery)
- **I need class accommodations for a disability, illness, or other reason** – First talk to [Disability Services](#) office. They will meet with you virtually and help you with your individual needs. We can only activate your accommodations after you talk with Disability Services. Then talk to Dr. Guerriero about this class; they are happy to help you with what you need.

Tentative Schedule
(Subject to change without prior notice)

Date	What we are discussing?	What do I need to do to be prepared?	When are assignments due?
August 24 1	Introduction	<ul style="list-style-type: none"> • Read Welcome page • Review Syllabus and Course Calendar • Complete pre-assessment 	Due Monday 8/30 11:59pm (or in class) Complete the Neuroscience pre-assessment
August 31 2	Cells and Development	<ul style="list-style-type: none"> • Watch/Read Cells of the Nervous System Material • Watch/Read Building a Brain: Development Material • Week 2 Quiz 	Due Monday 9/6 11:59pm Week 2 Quiz
September 7 3	How is the Nervous System Organized? How do Nerves communicate?	<ul style="list-style-type: none"> • Watch/Read Organization of the Nervous System Material • Watch/Read the Action Potentials and Synapses Material 	Due Monday 9/13 11:59pm Week 3 Quiz
September 14 4	Scientific Principles: Evidence-Based Science	<ul style="list-style-type: none"> • Read What Makes Everyday Scientific Reasoning So Challenging? By Shah <i>et al.</i>, 2017 • Watch Scientific Principles: Evidence-Based Science Lecture • Take the Respondus Test Quiz (to ensure Respondus is working for next week's exam) 	Due Monday 9/20 11:59pm Week 4 Activity Week 4 Quiz Take the Respondus Test Quiz
September 21 5	No class – optional office hours for Exam 1	<ul style="list-style-type: none"> • Prepare for Exam 1 Take Exam 1 (Open Monday 12:00am – Sunday 11:59pm)	Due Monday 9/27 11:59pm Exam 1
September 28 6	The Senses	<ul style="list-style-type: none"> • Watch/Read The Senses Part 1 and The Senses Part 2 Material 	Due Monday 10/4 11:59pm Week 6 Quiz
October 5 7	Movement and Stress	<ul style="list-style-type: none"> • Watch/Read the Movement Material • Watch/Read the Stress Material 	Due Monday 10/11 11:59pm Week 7 Quiz
October 12 8	No class this week (Fall break)		
October 19 9	Emotion, blood, feeding and motivation	<ul style="list-style-type: none"> • Watch/Read the Scientific Principles: Sources Material • Read the Neuroscience and Society Project guidelines 	Due Monday 10/25, 11:59pm Week 8 Quiz

		<ul style="list-style-type: none"> • Watch the Neuroscience and Society Project Video Description 	
October 26 10	Scientific Principles: sources and neuroscience and society project intro	<ul style="list-style-type: none"> • Watch/Read the Emotion Material • Watch/Read the Blood and Barriers Material • Watch/Read the Feeding and Motivation Material 	<p>Due Monday 11/1 11:59pm</p> <ul style="list-style-type: none"> • Week 9 Quiz
November 2 11	No class – optional office hours for Exam 2	<ul style="list-style-type: none"> • Prepare for Exam 2 <p>Take Exam 2 (available Monday 12:00am – Sunday 11:59pm)</p>	<p>Due Monday 11/8 11:59pm</p> <p>Exam 2 Topic for Neuroscience and Society Project</p>
November 9 12	Sleep and Circadian Rhythms	<ul style="list-style-type: none"> • Bring sleep journal to class • Sleep and Circadian Rhythms Material 	<p>Due Monday 11/15 11:59pm</p> <p>Week 11 Quiz</p>
November 16 13	Sci principles: methods, emerging technology, neuroethics	<ul style="list-style-type: none"> • Watch/Read the Scientific Principles: Methods and Emerging Technologies Material • Watch/Read the Scientific Principles: Neuroethics Material 	<p>Due Monday 11/22 11:59pm</p> <p>Week 12 Quiz</p>
November 23 14	Learning, memory, and disease	<ul style="list-style-type: none"> • Watch/Read the Neurodegenerative Diseases Material 	<p>Due Monday 11/29 11:59pm</p> <p>Week 13 Quiz</p>
November 30	Student choice lecture		<p>Due Monday 12/6 11:59pm</p> <p>Neuroscience and Society Project</p>
December 7	Reading day – Optional review session	Come with questions or to just listen	<p>Due Dec 14</p> <p>Complete the Neuroscience post-assessment</p>
December 14	Finals Week		