Seminar in Neuroscience:
Neurobiology of Mental Disorders
NEUR 411-001
Spring 2025

Instructor: Dr. Jennifer Brielmaier (Sontag) **E-mail address:** jbrielma@gmu.edu
Class time: Tues 10:30 am -1:10 pm **Office phone #:** 703-993-1469
Class location: Horizon Hall 4000 **Office location:** DK 2044
Office hours: Mon 3-4 pm (Zoom) & by appt

Appointment scheduling link: https://brielmaiersontag.youcanbook.me/
Zoom link for office hours: https://gmu.zoom.us/j/8641621768

Grading TA and email: Bahar Shahraki fshahrak@gmu.edu

Course Description:

The WHO estimates that about 1 in every 8 people in the world live with a diagnosable mental disorder. The primary goal of this course is to provide advanced undergraduate students an opportunity to explore the biological bases of the more common disorders including major depression, anxiety, bipolar disorder, schizophrenia, and substance abuse disorder. We will explore three major themes: 1) the role of stress in psychopathology (namely depression and anxiety disorders); 2) the neurobiology of schizophrenia; and 3) neuroadaptations in substance abuse disorder. Emphasis will be placed on current strategies used to investigate the pathophysiology and treatment of these disorders, including human imaging and postmortem tissue studies, animal and in vitro models, and genetic approaches.

Course Format:

Class meetings will consist of a combination of lectures, student-led presentations of journal articles, and scientific writing activities. This course is designed to develop your skills in reading, analyzing, and interpreting scientific data, while emphasizing practical scientific writing and presentation skills.

This course is part of the Mason Core and fulfills requirements for Writing Intensive (WI) in the Neuroscience major.

Upon completing a Writing Intensive Course, students will be able to:

1. Use informal or formal writing in ways that deepen their awareness of the field of study and its subject matter (Writing to Learn).
2. Compose one or more written genres specific to the field of study in order to communicate key ideas tailored to specific audiences and purposes; genres may be academic, public, or professional (Writing to Communicate).
3. Draft and revise written works based on feedback they receive from instructors and peers, using strategies appropriate to the genre, audience, and purpose (Writing as a Process).

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Writing intensive courses are required to assign a minimum of 3500 words. This course meets and exceeds this requirement through the 500-word journal entries, 1500-word literature review, and 2500-word final research proposal. The literature review and the research proposal will be completed through a draft/feedback/revision process as described in the Tentative Schedule.

Course Modality:

This is an in-person, face-to-face course. There will be no concurrent instruction, meaning the class will not be streamed online, and students will not be able to attend virtually. If you are unable to come to class due to illness or any other reason, please see the policy under Attendance and Makeup Policies below.

Textbook: none required
Required Readings: PDFs or links to downloadable PDFs available on Canvas

Optional Resources:

- Harrington, M (2011). *The Design of Experiments in Neuroscience*, *2nd Edition.* Sage Publications. ISBN-13: 978141297432
- Zinsser, W. (2016). *On Writing Well: The Classic Guide to Writing Nonfiction, 30th Anniversary Edition*. HarperCollins. ISBN-13: 9780060891541
- Strunk, W., & White, E.B. (2000). *The Elements of Style, 4th Edition*. New York: Longman.

Learning Goals:

By the end of this course, you should 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 symptoms and neurobiological bases of specific mental disorders
- Describe methods and models used in neuroscience and mental disorders research
- Apply the basic principles of research methods including literature reviewing, research ethics, hypothesis formulation, experimental design, and discussion of expected findings
- Apply the principles of scientific writing to written assignments
- Communicate scientific ideas to multiple audiences
- Effectively respond to feedback and make changes in writing

Assessments and Grading:

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

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Assignment	Points
Journal Entries	96
Discussion Leading	24
Literature Review Topic and Key References	5
Literature Review Outline	10
Draft Literature Review	14
Final Literature Review	32
Research Questions/Hypotheses	5
Draft Research Plan	14
Final Research Proposal	48
In-Class Participation	30
Total	**278**

Grades will be assigned based on the following scale:

A+ 97% or above	B+ 87-89%	C+ 77-79%	D 60-69%
A 93-96%	B 83-86%	C 73-76%	F 59% & below
A- 90-92%	B- 80-82%	C- 70-72%	

Assignments:

- **Discussion Leading:** You will work in pairs or small groups to lead a detailed presentation and discussion of a primary journal article. The goal of this assignment is to improve your ability to communicate, evaluate, and question the scientific findings of others. The primary journal article will be assigned to you. Additional details will be provided. Your discussion leading will be assessed using a 24-point grading rubric.

- **Journal Entries:** Before each journal article discussion, you will write a journal entry (max 500 words) about the assigned article. The goal of these entries is to prepare you for class discussions and to get comfortable reading and critically analyzing original research. Entries will be written in response to research articles that will be discussed that day. Entries will be submitted in Blackboard and graded with constructive feedback given. Entries are due 1 hour before the beginning of the class meeting in which the article will be discussed.

  You will not write a journal entry for the article on which you will lead the class discussion, and you can miss two journal entries without penalty. This means that a total of 8 journal entries count toward your final grade for a total of 96 possible points. Late journal entries will be subject to a 3 point penalty, starting at class time. 3 more points will be deducted for each additional day late. Journal entries submitted more than 4 days after the deadline will thus receive a zero. Late entries are likely to be graded on a delayed schedule.

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Literature Review: Before proposing new research, it is important to understand what we do and do not already know about a topic. To prepare you to propose a novel research study, you will first write a focused literature review on a topic of your choosing. The topic must be related to one of the course themes. Your review will summarize and synthesize the most relevant research that has been done on the topic, and identify at least one critical knowledge gap that could be addressed in future research. You will complete the review in the following steps: 1) choice of topic and key references; 2) paper outline; 3) rough draft; and 4) final version. Guidelines for each assignment will be provided. These assignments are collectively worth a total of 61 points (see grading breakdown above). Feedback from the instructor and/or TA will be given at each step. See the schedule below and Canvas for due dates.

- **Research Proposal:** After reviewing the relevant literature, you will come up with at least one novel research question or hypothesis and propose a study to address/test it. The proposal will have multiple sections including an abstract, background/significance, methods, and expected results based on previous research. Like the literature review, the proposal will be completed through a draft/feedback/revision process with several steps along the way. Guidelines for each assignment will be provided. Students are encouraged to meet with me before finalizing their research questions/hypotheses, and during the proposal development process as needed. The assignments related to the proposal are worth a total of 67 points (see grading breakdown above). The due dates for each assignment can be found in the schedule below and on Canvas. During our final class meeting you will receive two peer reviews of your proposal draft so you can incorporate the feedback into your final proposal.

- **Participation:** In-class participation is essential for your learning and success in this seminar course. Participation points are earned by *actively participating* in class discussions, asking questions during lectures, and/or completing any activities assigned during class. For article discussions in particular, your contributions to the discussion (questions or comments) must reflect that you have read the article being discussed.

  Your participation is not scored on the first day of class; nor is it scored on the day you lead an article discussion as this is factored into your discussion leading grade. You can miss two class meetings without penalty. This means you can earn a maximum of 30 total participation points throughout the semester (0-3 points x 10 class meetings). <u>Participation points cannot be made up outside of class, even if you tell me in advance that you will be absent.</u> All students' participation points will be capped at 30; in other words, there is no extra credit for attending all class meetings.

The following rubric will be used to determine each student's participation score each week:

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Excellent (3)	**Average (2)**	**Poor (0-1)**
Arrives on time and preparation before class is very evident. Participation is active and effective (e.g. contributing to small group and whole class discussion, asking and answering questions, taking a leadership role).	Preparation is somewhat evident. There is some participation but also a fair amount of passive listening within the group and whole class discussions. May have arrived 10-15 minutes late or engaged in some off-task behavior (e.g. side conversations, cell phone use).	Did not attend class or was more than 15 minutes late; or was present but showed no evidence of participation; or was disruptive/disrespectful, and/or engaged in repeated off-task behavior.

Commitment to an inclusive learning environment:

Your experience in this class is important to me. It is my intent that students from all diverse backgrounds, perspectives and circumstances be well served by this course and that students' learning needs are addressed. If there are aspects of the design, instruction, and/or experiences within this course that result in barriers to your inclusion or accurate assessment of your achievement, please notify me as soon as possible and/or contact the Office of Disability Services. If you are seeking accommodations for this class, please first visit http://ds.gmu.edu/ for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. I cannot give extensions, allow makeup/alternative work, waive the attendance/participation requirement, or make any other types of adjustments that are not specifically covered by an accommodations letter for the current semester. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu | Phone: (703) 993-2474

Attendance and Late Work/Makeup Work Policies:

Students are responsible for checking the GMU Academic Calendar and making sure they are available to attend class and complete coursework throughout the entire semester.

Policies for missed classes and late work are as follows:

- Two class meetings can be missed without penalty; therefore, participation points from missed classes cannot be made up.
- Late journal entries will incur a 3 point deduction, starting at class time. An additional 3 points will be deducted for each additional day late. Entries turned in more than 4 days late will receive a zero.
- Other written assignments will incur a deduction of 10% per day late, starting 24 hours after the deadline. Late work will not be accepted more than 1 week after the original due date. Submitting drafts late means you may not receive any feedback before the final version is due. **No late work will be accepted after May 13th.**

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Academic standards:

Students are expected to follow the university's Academic Standards at all times in this course. The standards are upheld in the principles listed below. For more information, please see the Academic Standards website and the Academic Standards Code.

- **Honesty:** Providing accurate information in all academic endeavors, including communications, assignments, and examinations.
- **Acknowledgement:** Giving proper credit for all contributions to one's work. This involves the use of accurate citations and references for any ideas, words, or materials created by others in the style appropriate to the discipline. It also includes acknowledging shared authorship in group projects, co-authored pieces, and project reports.
- **Uniqueness of Work:** Ensuring that all submitted work is the result of one's own effort and is original, including free from self-plagiarism. This principle extends to written assignments, code, presentations, exams, and all other forms of academic work.

Generative AI policy:

Generative AI tools such as ChatGPT can both enhance and interfere with learning and professional development. All use of generative AI in this course must comply with the university's Academic Standards. Two very important things to keep in mind are that 1) ChatGPT does not always produce accurate information OR citations and 2) text written by ChatGPT does not reflect your own scholarly thinking and understanding. Unless specifically noted, generative AI tools may not be used for the assignments in this course. If use of AI is permitted for any part of an assignment, the type of tool used and the nature of the use must be disclosed. Violations may be referred to the Academic Standards office and subject to sanctions as laid out in the Academic Code.

Inclement weather/class cancellation policy:

Following a Mason Alert announcing an inclement weather campus closure, please be sure to check your email and/or our course Canvas page to see what our class plans will be. If an in person class meeting needs to be canceled for weather or another reason, class *may* be held online via Zoom. If that is not possible, asynchronous work may be assigned. Any adjustments to the class schedule will be clearly indicated by a revised syllabus and an announcement on Canvas/email sent to students.

Technology statement:

Required knowledge of technology for this course includes the ability to access course materials posted on Canvas and/or sent via email to your GMU address. Your Honors project will also require you to learn how to use various software programs such as those for reference management, survey design, and data collection/analysis, and/or other specialized research equipment.

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Policy on technology in the classroom: Laptops and tablets are permitted for class related activities. The use of cell phones is discouraged. Multitasking during class meetings will negatively affect the participation part of your grade.

Enrollment:

Students are responsible for verifying their enrollment in this class. Schedule adjustments should be made by the deadlines published in the Schedule of Classes. After the last day to drop a class, withdrawing from this class requires the approval of the dean and is only allowed for nonacademic reasons. Undergraduate students may choose to exercise a selective withdrawal. See the Schedule of Classes for selective withdrawal procedures.

Notice of a mandatory reporting of sexual assault, interpersonal violence, and stalking:

As a faculty member, I am designated as a "Responsible Employee", and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per University Policy 1412. If you wish to speak with someone confidentially, please contact one of Mason's confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling & Psychology Services (CAPS) at 703-993-2380. You may also seek assistance from Mason's Title IX Coordinator by calling 703-993-8730 or emailing cde@gmu.edu.

Religious Holidays:

A list of religious holidays is available on the University Life Calendar page. See the Religious Holiday Calendar. Any student whose religious observance conflicts with a scheduled course activity must contact me at least 2 weeks in advance of the conflict date in order to make alternative arrangements.

Resources for Students:

CHSS PASS	https://academicaffairs.chss.gmu.edu/undergraduate-students/pass-program
University Writing Center	http://masononline.gmu.edu/student-resources/writingcenter
University Libraries	http://library.gmu.edu/
Center for Community Mental Health	http://ccmh.gmu.edu/
University Career Services	http://careers.gmu.edu/
Student Health Services	http://shs.gmu.edu/
Student Support and Advocacy	https://ssac.gmu.edu/

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Official Communications via GMU E-mail:

Mason uses electronic mail to provide official information to students. Examples include communications from course instructors, notices from the library, and notices about academic standing, financial aid information, class materials, assignments, questions, and instructor feedback. You are responsible for the content of university communication sent to their Mason e-mail account and are required to activate that account and check it regularly.

FERPA:

This course will be compliant with the Family Educational Rights and Privacy Act of 1974 (FERPA) as detailed here.

Add/Drop Deadlines:

Last day to add Jan 28
Last day to drop with 100% tuition refund Feb 4
Last day to drop with 50% tuition refund Feb 11
Unrestricted withdrawal period (100% tuition liability) Feb 12-25

Course Content and Mental Health:

This course offers the opportunity to explore our current understanding and new ideas about the biology of mental disorders. I value the contributions of all members of the class, and realize that some members of the classroom community may have personal experience with one or more of the disorders to be discussed. I expect that classroom discussions be conducted with respect for all persons at all times. Please be aware of the content and quantity or your comments in class to assist in creating an environment where students feel respected. The use of language, written materials or multimedia that degrades individuals suffering from mental disorders will not be tolerated, and participation or discussion leading points will be deducted accordingly. If you are feeling uncomfortable with or distressed by class activities or discussion content, please come and talk to me. If you are struggling with your own mental health, I encourage you to take advantage of the resources offered at Mason, to which I have provided links below.

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Tentative Schedule:
Readings subject to change. Please check the syllabus and Canvas frequently.

Date	**Topic**	**Assignments Due** (1 hour before class on Canvas)
Week 1 Jan 21	Course Introduction Lecture: Introduction to Scientific Writing Principles Activity: Editing and Simplifying Writing	Read through the syllabus carefully Read over Journal Entry and Discussion Leading Guidelines
Week 2 Jan 28	Journal Entry Guidelines Discussion Leading Guidelines Lecture: Psychiatric Disorders Overview/Depression and Anxiety Activity: Analyzing a Journal Article	Read over Journal Entry and Discussion Leading Guidelines Read "How to Read a Journal Article" slides and Critical Reading Questions document Read Sheline et al 1996
Week 3 Feb 4	Discussion: Saltarelli et al 2003 Research Proposal Guidelines	Plagiarism and Citation Material **Plagiarism and Citation Quiz** Read Saltarelli et al 2003 Journal Entry 1
Week 4 Feb 11	Discussion: Boldrini et al 2019 Lecture/Activity: Locating and Organizing Sources	Read Boldrini et al 2019 Journal Entry 2 **Download Zotero and read Quick Start Guide**

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Week 5 Feb 18	Discussion: Zhou et al 2020 Lecture: Lit review writing	Read Zhou et al 2020 Journal Entry 3 **Literature Review Topic and Key References**
Week 6 Feb 25	Discussion: Garabadu and Kumar 2019 Lecture: Neurobiology of schizophrenia	Read Garabadu and Kumar 2019 Journal Entry 4 **Literature Review Outline**
Week 7 Mar 4	Discussion: Tomasella et al 2018 Activity: Lit Review Organization/Logical Flow	Read Tomasella et al 2018 Journal Entry 5 **Draft Literature Review**
Week 8 Mar 11	**SPRING BREAK – NO CLASS**	
Week 9 Mar 18	Discussion: Diamantopoulou et al 2017 Lecture: Responding to Feedback	Read Diamantopoulou et al 2017 Journal Entry 6
Week 10 Mar 25	Discussion: Kaul et al 2024 Lecture: Generating Research Questions/Hypotheses	Read Kaul et al 2024 Journal Entry 7 **Revised Literature Review**
Week 11 Apr 1	Discussion: Bois et al 2014 Lecture: Neurobiology of Substance Abuse Disorders	Read Bois et al 2014 Journal Entry 8
Week 12 Apr 8	Discussion: Di Chiara and Imperato 1988 Lecture: Research Designs	Read Di Chiara and Imperato 1988 Journal Entry 9

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		Research Questions/Hypotheses
Week 13 Apr 15	Discussion: Carmack et al 2022 Lecture: Writing a Research Plan	Read Carmack et al 2022 Journal Entry 10
Week 14 Apr 22	Discussion: Tanabe et al 2009 Lecture: Peer Review Guidelines	Read Tanabe et al 2009 Journal Entry 11 **Draft Research Plan**
Week 15 Apr 29	Activity: Research Proposal Peer Reviews	**Full Proposal Draft for Peer Review**
Week 16 May 6	**NO CLASS (Final exam period)** **Final proposal due on Canvas 11:59 pm**	