Seminar in Neuroscience:
Neurobiology of Mental Disorders
NEUR 411-001
Spring 2024

`2wWWWWSDXZ **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 4001   **Office location:** DK 2044
Office hours: Mon 2-3 pm & by appointment (all on Zoom)

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

Grading TA and email: Madinah Azizi, mazizi2@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 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 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.

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

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
- 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.

Assignment	Points
Journal Entries	96
Discussion Leading	20
Literature Review Topic and Key References	5
Literature Review Outline	10
Draft Literature Review	14
Final Literature Review	28
Research Questions/Hypotheses	5
Draft Research Plan	14
Final Research Proposal	48
In-Class Participation	30

Total	**270**

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 20-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 <u>1 hour before the beginning of the class meeting</u> 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 10% per day penalty. Journal entries submitted more than 10 days after the deadline will not be accepted. Late entries are likely to be graded on a delayed schedule.

  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 57 points (see grading breakdown above). Feedback will be given at each step. See the schedule below and Blackboard 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 97 points (see grading breakdown above). The due dates for each assignment can be found in the schedule below and on Blackboard.

- **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). Participation points cannot be made up outside of class. All students' participation points will be capped at 30; i.e., is no extra credit for attending all class meetings.

  If you are sick, quarantining, or have an excused absence from class, you will be assigned make-up work to earn your participation grade for that day. It is your responsibility to ask what make-up work is required for an absence.

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

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 a few minutes late or engaged in some off-task behavior (e.g. side conversations, cell phone use).	Did not attend class or was extremely 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. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu | Phone: (703) 993-2474

Attendance and Makeup 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. Given that students can miss two class meetings without penalty, the general policy is that a missed class will result in a participation score of 0 for that day. Makeup work is reserved for students whose disability accommodations specify flexibility with attendance. Students without such accommodations *may* be given the opportunity to make up participation points under rare circumstances, at the discretion of the instructor. Documentation may be required.

Out of class assignments turned in late will incur a deduction of 10% per day 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 3rd**.

Academic Integrity:

To promote a stronger sense of mutual responsibility, respect, trust, and fairness, all members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work. GMU has an Honor Code with clear guidelines. Principles that must be followed include 1) all work submitted must be your own, 2) when using the work and/or ideas of others, give full credit through accurate citations and 3) if there is uncertainty about how to complete the work please ask for clarification. **You must put any information from a source into your own words. Do not copy anything word for word, even if you are citing the source. Quotes should be not be used in your writing for this course.** Violations of the Honor Code will be reported according to GMU procedures.

If you have questions about when the contributions of others to your work must be acknowledged and appropriate ways to cite those contributions, please talk with me. Here is a

great online quiz that you can take to check your knowledge about what is and is not plagiarism: http://www.easybib.com/guides/quiz-is-it-plagiarism/.

Generative AI Statement:

My thinking right now is that there are ethical and unethical uses for generative AI tools such as ChatGPT. An example of an ethical use is to ask ChatGPT to correct spelling or grammar, or to explain something in simpler terms. An example of an unethical use is to ask it to write a document for you that you then submit as your own work. Two very important things to keep in mind are that 1) Generative AI does not always produce accurate citations or information; and 2) text written by a generative AI tool does not reflect your own scholarly thinking and understanding. Both of these things have implications for your development as a student and scientist. Using text created by ChatGPT and representing it as your own work may represent a violation of the University Honor Code and will be treated as such.

Class Modality Change/Cancellation Policy:

In the event that an in-person class meeting is not possible due to instructor illness or personal/family emergency, our class meeting *may* be moved to Zoom. If that is not possible, asynchronous work will be assigned. Any announcements pertaining to class modality change/cancellation will be posted on Blackboard and emailed to students.

Communication:

I will post course messages to the Announcements page on Blackboard and also send them via email. If you need to contact me, please do so **from your university e-mail account only**. **Include the course name in the subject line and your name in the e-mail**. Check your e-mail and course Blackboard account frequently and before each class meeting. You are responsible for all announcements posted and sent via email, in addition to announcements made in class, regardless of whether or not you are present.

Technology:

Required knowledge of technology for this course includes the ability to access course materials posted on Blackboard and/or sent via email to your GMU address. The writing assignments will also require you to learn how to use research databases, library resources, and reference management software such as Zotero.

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

Course Content and Mental Health:

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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.

Resources for Students:

Safe Return to Campus	https://www2.gmu.edu/Safe-Return-Campus
University Writing Center	http://masononline.gmu.edu/student-resources/writingcenter
University Libraries	http://library.gmu.edu/
Counseling & Psych Services	http://caps.gmu.edu/
University Career Services	http://careers.gmu.edu/
Student Health Services	http://shs.gmu.edu/
Student Support and Advocacy	https://ssac.gmu.edu/

Religious holidays:

Please refer to George Mason University's calendar of religious holidays and observations (http://ulife.gmu.edu/calendar/religious -holiday-calendar/). It is the student's responsibility to speak to the instructor in advance should their religious observances impact their participation in class activities and assignments.

Student privacy:

George Mason University strives to fully comply with FERPA by protecting the privacy of student records and judiciously evaluating requests for release of information from those records.
Please see George Mason University's student privacy policy
https://registrar.gmu.edu/students/privacy/

Add/Drop Deadlines: Deadlines for the Spring 2023 semester can be found on the Mason Academic Calendar page.

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Tentative Schedule:

Date	Topic	Assignments Due (1 hour before class on Blackboard)
Week 1 Jan 16	Course Introduction Lecture: Introduction to Scientific Writing Activity: Simplifying Writing	Read through the syllabus carefully Read over Journal Entry and Discussion Leading Guidelines
Week 2 Jan 23	Journal Entry Guidelines Discussion Leading Guidelines Lecture: Psychiatric Disorders Overview/Depression and Anxiety Activity: Analyzing a Journal Article	Read "How to Read a Journal Article" slides and Critical Reading Questions document Read Sheline et al 1996 Plagiarism and Citation Material **Plagiarism and Citation Quiz**
Week 3 Jan 30	Discussion: Malberg et al 2000 Grant Proposal Guidelines	Read Malberg et al 2000 Journal Entry 1
Week 4 Feb 6	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**

Week 5 Feb 13	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 20	Discussion: Garabadu and Kumar 2019 Lecture: Neurobiology of schizophrenia	Zhang et al 2020 Journal Entry 4 **Literature Review Outline**
Week 7 Feb 27	Discussion: Tomasella et al 2018 Activity: Lit Review Organization/Logical Flow	Tomasella et al 2018 Journal Entry 5 **Draft Literature Review**
Week 8 Mar 5	**SPRING BREAK – NO CLASS**	
Week 9 Mar 12	Discussion: Tamura et al 2016 Lecture: Responding to Feedback	Schizophrenia paper 2 Journal Entry 6
Week 10 Mar 19	Discussion: Kaul et al 2024 Lecture: Generating Research Questions/Hypotheses	Schizophrenia paper 3 Journal Entry 7 **Revised Literature Review**
Week 11 Mar 26	Discussion: Bois et al 2014 Lecture: Neurobiology of Substance Abuse Disorders	Schizophrenia paper 4 Journal Entry 8
Week 12 Apr 2	Discussion: Di Chiara and Imperato 1988 Lecture: Research Designs	Addiction paper 1 Journal Entry 9 **Research Questions/Hypotheses**

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Week 13 Apr 9	Discussion: Carmack et al 2022 Lecture: Writing a Research Plan	Addiction paper 2 Journal Entry 10
Week 14 Apr 16	Discussion: Tanabe et al 2009 Lecture: Peer Review Guidelines	Addiction paper 3 Journal Entry 11 **Draft Research Plan**
Week 15 Apr 23	Activity: Grant Proposal Peer Reviews	**Full Proposal Draft for Peer Review**
Week 16 Apr 30	**Final proposal due on Blackboard 11:59 pm**	