NEUROSCI 391-392 and 493-496 Syllabus

Research Independent Study/Scholarship in Neuroscience

Fall 2025-forward

Duke UNIVERSITY

PSYCHOLOGY & NEUROSCIENCE

What is this course about?

Many of the best and most exciting learning experiences happen in research. Accordingly, students in neuroscience are strongly encouraged to pursue research independent study/scholarship projects in some area of neuroscience under the supervision or sponsorship of Undergraduate Neuroscience Faculty. Research Independent Studies/Scholarship in Neuroscience are academic courses [NEUROSCI 391-392, 493-496] of scholarly content overseen by faculty principal investigators. The criteria for Independent Study/Scholarship include:

1. **Mentorship**. Mentorship is the responsibility of a faculty member (affiliated non-faculty research associates and assistants may also contribute to the supervision of the undergraduate student and the research they perform).

2. **Neuroscience**. The student's research must focus in some domain of neuroscience, as the field is commonly recognized and understood. For Research Independent Study courses (NEUROSCI 493-496), the research occurs primarily in a basic science or clinical science research setting. Independent Scholarship (NEUROSCI 391-392) projects may be done outside of a laboratory setting. The student must explain in their proposal for research independent study/scholarship how their work will contribute to the advancement of knowledge and understanding in the field of neuroscience.

3. **Scholarship**. The work should be fundamentally academic and/or scholarly in nature (e.g., the acquisition or development of research techniques may be included as part of the experience; but should not be the primary goal of the research independent study).

What background knowledge do I need before taking this course?

Eligible students are typically in their junior or senior year and should have completed 2 or more Neuroscience courses (courses that carry the NEUROSCI subject code). Interested sophomores may also be eligible, but they should first discuss their plans for independent study/scholarship with the Director of Undergraduate Studies in Neuroscience or the Associate Director. Students pursuing a minor in Neuroscience may also enroll in research independent study/scholarship. Only two independent study/scholarship courses may count as electives toward the Neuroscience major and minor.

What will I learn in this course?

For independent study courses (NEUROSCI 493-496), students will be engaged in hands-on laboratory work with the goal of collecting and analyzing data toward their projects. For independent scholarship courses (NEUROSCI 391-392) students read, discuss, and synthesize knowledge in a domain of interest. The skills gained from these courses could include learning how to design and implement experiments, collect and report data, perform appropriate statistical analysis, or carry out a literature review, as well as helping to further develop science communication skills through writing and public speaking.

What is the AI policy?

Artificial Intelligence may NOT be used to generate text for the end of term semester paper. The mentor and student are required to review the AI acknowledgement section and the syllabus provided in the Kuali form when signing up for a project.

How will my grade be determined?

At the end of the term, the research activities for an independent study course (NEUROSCI 493-496) should be summarized in a **substantive written paper**, which should take the form of scientific manuscript, with Background and Significance, Methods, Results and Discussion sections (standard APA format, other neuroscience journal format, or grant proposal format is acceptable). The precise format and length of this paper should be discussed by the student and research mentor. At the end of the term, the paper should be submitted to the research mentor for evaluation. If a student has also been approved for a writing (W) code, the student and faculty mentor must follow through on the stated plan for iterative writing and feedback, as detailed in the W-code petition form.

For independent scholarship courses (NEUROSCI 391-392), students may generate an end-of-term written report or develop a multimedia project, website, exhibition, performance or other scholarly work that may be appropriate for the project, as determined by the faculty mentor.

The student's grade for the term will in part depend on the faculty mentor's evaluation of the scholarly product(s), as well as their effort during the semester (see evaluation rubric items below). A digital copy of the final scholarly product(s) must be submitted electronically to Tyler Lee (tyler.lee@duke.edu) in the Office of Undergraduate Studies in Neuroscience.

Evaluation Rubric and Grade Calculation

Recommended guidelines and items for grading NEUROSCI 493-496 courses:
(Faculty may adopt or adapt the items below as fits their project, or they may substitute their own evaluation system. If a substitute evaluation system is used, the faculty mentor should document that system here.)

1. The substantive end-of-term paper adequately reviews the literature, demonstrates how the student's research fills a gap, and presents a compelling argument for the significance and scientific value of the student's research.
   1. Strongly disagree 2. 3. 4. 5. Strongly agree

2. The substantive end-of-term paper describes the methods and measures used in the study in a manner that provides a clear understanding of what was done.
   1. Strongly disagree 2. 3. 4. 5. Strongly agree

3. The tables and figures used in the results section are clear and informative.
   1. Strongly disagree 2. 3. 4. 5. Strongly agree

4. The discussion section provides a compelling discussion of the findings and their implications for advancing knowledge and understanding in neuroscience.
   1. Strongly disagree 2. 3. 4. 5. Strongly agree

5. The discussion section identifies appropriate limitations of the study and suggests how those limitations could be addressed in future work.
   1. Strongly disagree 2. 3. 4. 5. Strongly agree

6. The paper is virtually free of obvious errors such as typos, misspellings, ungrammatical sentences, missing figure legends or references, etc.
   1. Strongly disagree 2. 3. 4. 5. Strongly agree

7. The student regularly attended weekly mentor meetings.
   1. 2. 3. 4. 5.

Strongly disagree Strongly agree

8. In general, the student followed the weekly work schedule.
   1. 2. 3. 4. 5.
   Strongly disagree Strongly agree

9. The student demonstrated dedication to the research project.
   1. 2. 3. 4. 5.
   Strongly disagree Strongly agree

10. The student made the expected amount of progress on the project during the academic term.
    1. 2. 3. 4. 5.
    Strongly disagree Strongly agree

11. The student was an effective collaborator and demonstrated strong communication skills.
    1. 2. 3. 4. 5.
    Strongly disagree Strongly agree

12. The student was receptive to feedback on the project throughout the academic term.
    1. 2. 3. 4. 5.
    Strongly disagree Strongly agree

13. The student was respectful to other members of the research group.
    1. 2. 3. 4. 5.
    Strongly disagree Strongly agree

To calculate the course grade, add together the scores from items 1-13 and then divide by 65. For example, 60/65 = 92%, which would result in a letter grade of A- (see letter grading scheme below)

Recommended guidelines and items for grading NEUROSCI 391-392 courses:
(Faculty may adopt or adapt the items below as fits their project, or they may substitute their own evaluation system. If a substitute evaluation system is used, the faculty mentor should document that system here.)

1. The scholarly project provides a compelling case for the importance of the work.
   1. 2. 3. 4. 5.
   Strongly disagree Strongly agree

2. The scholarly product describes the approaches used and provides a clear understanding of what was done.
   1. 2. 3. 4. 5.
   Strongly disagree Strongly agree

3. The scholarly product represents an original synthesis of knowledge that advances understanding and/or insight in the targeted domain of inquiry within the field of neuroscience.
   1. 2. 3. 4. 5.
   Strongly disagree Strongly agree

4. The scholarly project is of high quality and virtually free of obvious errors such as typos, misspellings, ungrammatical sentences, missing figure legends or references, etc.
   1. 2. 3. 4. 5.
   Strongly disagree Strongly agree

5. The student regularly attended weekly mentor meetings.
   1. 2. 3. 4. 5.
   Strongly disagree Strongly agree

6. In general, the student followed the weekly work schedule.
   1. 2. 3. 4. 5.
   Strongly disagree Strongly agree

7. The student demonstrated dedication to the project.
   1. 2. 3. 4. 5.
   Strongly disagree Strongly agree

8. The student made the expected amount of progress on the project during the academic term.
   1. 2. 3. 4. 5.
   Strongly disagree Strongly agree

9. The student was an effective collaborator and demonstrated strong communication skills.
   1. 2. 3. 4. 5.
   Strongly disagree Strongly agree

10. The student was respectful to other members of the research group.
    1. 2. 3. 4. 5.
    Strongly disagree Strongly agree

11. The student was receptive to feedback on the project throughout the academic term.
    1. 2. 3. 4. 5.
    Strongly disagree Strongly agree

To calculate the course grade, add together the scores from items 1-11 and then divide by 55. For example, 47/55 = 85.5% B

Refer to the letter grade scheme below for guidance on how the rubric score translates to a letter grade to be assigned at the end of term.

A+	>97	B-	79.5-82.9	D	63.0-66.9
A	93.0-96.9	C+	77.0-79.4	D-	59.5-62.9
A-	89.5-92.9	C	73.0-76.9	F	<59.5
B+	87.0-89.4	C-	69.5-72.9		
B	83.0-86.9	D+	67.0-69.4		

General Course Policies

If your research independent study/scholarship project is through a Bass Connections team and you're receiving credit for NEUROSCI 391-392, 493-496, you are **not permitted** to also receive Bass Connections course credit.

Students proposing a second term of independent study on the same project should plan to enroll in NEUROSCI 494. Please note that **an approved proposal is required for enrollment in NEUROSCI 494 (similar to 493)**. In preparing a 494 proposal, the project description section should focus on the specific scientific aims and learning objectives that are to be accomplished in the second term of the research independent study. This applies to the NEUROSCI 495 and 496, research independent study 3 and 4.

Remember, no course credit can be awarded for paid work.

Please do not come to lab if you have cold symptoms to keep the university community as safe and healthy as possible. Please inform the faculty mentor of your absence and plan to complete any missed work. Students who encounter short- and long-term medical issues or instances of personal distress or emergency can seek academic support if needed.

Behavior and Community Standards

Duke University is a community dedicated to scholarship, leadership, and service and to the principles of honesty, fairness, respect, and accountability. Members of this community commit to reflect upon and uphold these principles in all academic and nonacademic endeavors, and to protect and promote a culture of integrity. Duke University has high expectations for students' scholarship and conduct. In accepting admission, students indicate their willingness to subscribe to and be governed by the rules and regulations of the university, which flow from the Duke Community Standard (DCS).

Regardless of course delivery format, it is the responsibility of all students to understand and follow all Duke policies, including academic integrity (e.g., completing one's own work, following proper citation of sources,

adhering to guidance around group work projects, and more). Ignoring these requirements is a violation of the DCS.

Students can direct any questions or concerns regarding academic integrity to the Office of Student Conduct and Community Standards at conduct@duke.edu and can access the DCS guide at www.dukecommunitystandard.students.duke.edu.

Rules for Video Recording Course Content: Recordings of activities pertaining to independent study/scholarship are permitted only with the consent of your mentors; they are for private study and learning only. You cannot distribute recordings to anyone else without authorization of the faculty of record (faculty mentor or PI). Unauthorized distribution of course recordings is a violation of the DCS and cause for disciplinary action.

Mental Health and Wellness Resources

Duke is committed to holistic student wellbeing; this includes one's mental, emotional and physical health. The university offers resources to help students manage daily stress, to encourage intentional self-care, and access just-in-time support. If you find you need support, your mental and/or emotional health concerns are impacting your day-to-day activities, your academic performance, or you need someone to talk to, the resources below are available to you:

DukeReach provides comprehensive outreach services to support students in managing all aspects of wellbeing, including referrals, and follow-up services for students who are experiencing significant challenges related to mental health, physical health, social adjustment, and/or a variety of other stressors. You can reach the DukeReach team at dukereach@duke.edu.

Counseling and Psychological Services (CAPS), (919) 660-1000. CAPS services include individual and group counseling services, psychiatric services, and workshops. CAPS also provides referrals to off-campus resources for specialized care.

TimelyCare (formerly known as Blue Devils Care) is an online platform that is a convenient, confidential, and free way for Duke students to receive 24/7 mental health support through TalkNow and scheduled counseling. https://Timelycare.com/bluedevils

BC Fellows for Healthy Relationship: The BC Fellows meet with students individually and in groups, supporting the development of healthy relationships and building meaningful community in all areas of a student's lives. To get in touch with the BC Fellows, go to https://students.duke.edu/wellness/duwell/sexualhealth/balthrop-cassidy-fellowship/.

DukeLine: Students who want to anonymously connect with a Peer Coach can text 984-230-4888 from 5-11 pm daily. DukeLine offers in-the-moment anonymous, non-emergency text support from a peer. Additional information is available at https://sites.duke.edu/dukeline.

DuWell, (919) 681-8421 provides Moments of Mindfulness (stress management and resilience building) and meditation programming (Koru workshop) to assist students in developing a daily emotional wellbeing practice. All are welcome, and no experience is necessary.

Academic Accommodations

If you are a student with a disability and need accommodations for this class, it is your responsibility to register with the Student Disability Access Office (SDAO) and provide them with documentation of your disability. SDAO will work with you to determine what accommodations are appropriate for your situation. Please note that accommodations are not retroactive and disability accommodations cannot be provided until a Faculty Accommodation Letter has been given to me. Please contact SDAO for more information: sdao@duke.edu or access.duke.edu.

Religious Accommodations

University policy permits students to be absent from class to observe a religious holiday. Accordingly, Trinity College of Arts & Sciences and the Pratt School of Engineering have established procedures for students to notify their instructors of an absence necessitated by the observance of a religious holiday. Please submit requests for religious accommodations at the beginning of the semester so we can work to make suitable arrangements well ahead of time. You can find the policy and relevant notification form here: https://trinity.duke.edu/undergraduate/academic-policies/religious-holidays

Inclement Weather

Inclement Weather Policy- In the event of inclement weather or other connectivity-related events that prohibit attendance, your mentor will notify you how to make up missed course content and work.