

Interdisciplinary Approaches to Neuroscience (NEUR 542) Fall 2025

When and Where: This course will meet in person Mondays and Wednesdays from 4:00-5:15 pm in 4269 Beckman.

Course Coordinator: Michelle Tomaszycski, mlt10@illinois.edu, 217-333-1071. It is best to contact me via email. Office hours are by appointment only. I am also available before and after class.

Course Description: The purpose of Interdisciplinary Approaches to Neuroscience is to introduce students to the breadth of the field by learning about the research areas investigated broadly by faculty of the Neuroscience Program (NSP). Each week will focus on a different subfield of neuroscience and a research specialty of an NSP faculty member. Mondays we will discuss articles pertinent to the topic of the week; one “classic” or “foundational” article that defines the field and one recent paper in the field co-authored by the NSP faculty member. You will work alone or in pairs to lead discussion on these articles. Wednesdays will involve lectures and discussion facilitated by an NSP faculty member. In addition to discussing the specifics of their research, we will discuss what inspired each NSP faculty member to pursue research in their area, what are some of the big issues in their research area, and how they are developing their long-term research plan. The last 2 weeks will involve individual oral presentations on a paper from your advisor’s lab, a recent article that inspires you, or your first year project plan.

To sign up for a date to lead discussion, visit <https://uofi.box.com/s/r3s28onsz87ae548fd3en5dqjdl546iy>.

Student Learning Outcomes: By the end of the course, you should be able to:

- Understand how each field of neuroscience developed, by reading and discussing “classic” papers.
- Understand where the current frontier is in each field of neuroscience, by reading and discussing recent research papers.
- Critically analyze original source material in neuroscience thereby demonstrating a sophisticated understanding of the field.
- Communicate ideas in neuroscience through informal discussion and in writing.
- Disseminate scientific information to a diverse audience.

Requirements and Prerequisites: All first year NSP graduate students are required to take NEUR 542. Non-NSP students are expected to have a general background knowledge in one or more of the following areas related to the field of neuroscience: biology, chemistry, psychology, physics, or engineering.

Website: An Illinois Canvas website at <https://canvas.illinois.edu> has been established for the course. This site has links to the required readings and syllabus. You will also need to go to the site to complete weekly reflections and responses. You will need your Net ID and AD password to access the site.

Course Materials: There is required reading every week. These readings can be found on the Canvas course site.

Grading: Your grade in this class will be based on weekly reflection papers and responses, as well as discussion leading, an oral presentation, and attendance/participation. The assignments will be weighted as follows:

Reflection papers	10 points each x 9 = 90 pts
Responses	5 points each x 9 = 45 pts
Oral presentation	50 pts
Discussion Leading	50 pts
Attendance & Participation	50 pts
Total = 285 points	

Reflection papers (90 points) and responses (45 points): You will be required to submit a total of 9 reflection papers and responses based on the weekly lectures and readings (*you are not required to submit these the week that you lead discussion*). Reflection papers will be approximately 1 page in length (double-spaced), **due by 4pm on Monday**, and focus on your thoughts, opinions, insights about the two articles for the week. Reflection papers may include answers to questions such as: 1) what new insights did you gain and what surprised you? 2) was there anything that you disagreed with? 3) what did you not understand? 4) what do you think are the primary take home conclusions from the articles and

what did you learn? Reflections will be assigned one of 3 grades: 0 points = missing assignment, 7 points = mere summary of the articles, 10 points = good critical evaluation of the articles with a clear viewpoint. Responses will be approximately ½ page in length, **due on Sunday by midnight**, and address the following questions: 1) are there any lingering questions you have or parts of the articles/lecture that you didn't understand? 2) how has the information from this week changed your views of neuroscience? You may also include general thoughts about the week's material. Responses will be graded either 5 (complete) or 0 (missing). Please remember to be respectful of differing viewpoints and approaches to Neuroscience.

Oral presentation (50 points): At the end of the semester, each student will deliver a 10 minute presentation with approximately 5 PowerPoint slides. The presentation can be on 1) an original article (not a review article) from your lab, 2) an article that you find interesting, or 3) a research project that you are working on in your lab. The presentation should include an overall introduction and explanation of the context of the work, including clearly articulating the research question or gap in the literature that the study fills. The talk should also include the methods that were used, and at least one slide with a graph or table of results. The talk should end with the conclusions or expected results, and identify any weaknesses or limitations in the study design or interpretations. The talk will be followed by questions from the audience. Presentations will be graded using a rubric that includes the following criteria (10 points possible for each criterion): 1) clarity of the slides, 2) overall quality of the presentation, 3) clear description of the gap in knowledge the study addresses, 4) clarity of results, 5) clear conclusion and discussion, including weaknesses or limitations of study.

Discussion leading (50 points): 1-2 students will lead a Monday discussion section. Discussion leading grades will be based on the ability to: 1) focus discussion on the major points of the articles (20 points), 2) facilitate/assess knowledge gaps and so that we can teach each other (i.e. which neuroscience terms/concepts do we need to review?; 15 points), and 3) provide engaging/thought-provoking questions to spark discussion (15 points). Some caveats: 1) you do not need to be an expert in the material when leading a discussion and 2) you do not need to cover every figure in the paper. In fact, given the number of figures in most modern papers, this would be too much for the 75 minute discussion period.

Attendance and participation (50 points): The readings and other material will be discussed in a seminar format. While the Wednesday classes will involve some lecturing, there will also be quite a bit of discussion. As with any seminar, the discussions we have in class are critical to your overall learning experience. Furthermore, NSP faculty will be taking time to work with you. Consequently, attendance and participation are required. To calculate your grade—I will first assign a grade to the quality of your overall participation (50 points = insightful comments during 90% or more of our discussions). Then, a further 2 points will be deducted from your grade for each unexcused absence (you may receive up to 2 excused absences). Being more than 5 minutes late to class will result in a 1 point deduction for the day.

Class Absences and Late Work: Please notify me as soon as possible if you cannot attend class. Two excused absences will not be counted against you. Under extenuating circumstances, you may be granted further excused absences. See the college policy on absences for further information: <https://studentcode.illinois.edu/article1/part5/1-501/>. Late work will be deducted a half letter grade for each 24 hour period after the due date.

Grading Scale	A+	A	A-	B+	B	B-
	98-100%	93 -97%	90-92%	88-89%	83-87%	80-82%
C+	C	C-	D+	D	D-	F
78-79%	73-77%	70-72%	68-69%	63-67%	60-62%	0-59%

Academic Integrity: The Code of Policies and Regulations Applying to All Students will be applied in all instances of academic misconduct committed by students. This applies to all presentations, assignments and materials distributed or used in this course. You can review these policies at the following website: <http://admin.illinois.edu/policy/code/index.html> and specifically here: <http://studentcode.illinois.edu/article1/part4/1-401/>.

Disability Resources and Educational Services (DRES) Accommodation: To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TTY), or e-mail a message to disability@illinois.edu. We will try to meet all accommodations once the process has started. Please note that accommodations are not retroactive to the beginning of the semester, but begin the day you contact your professor, instructor or coordinator with a current letter of accommodation from DRES.

Tentative Schedule

Dates	Topic	Presenter	Discussion Leader(s)
August 25 and 27	Monday and Wednesday: Syllabus Day and Introductions		Michelle
Labor Day, September 1 off; September 3	Latest and Greatest in Neuroscience		*Bring a short summary of a recent research article in Neuroscience
September 8 and 10	Developmental Neuroimmunology	Adrienne Antonson	
September 15 and 17	Neurotoxicology and Endocrine Disrupting Chemicals	Megan Mahoney	
September 22 and 24	Evolutionary Neuroscience	Justin Rhodes	
September 29 and October 1	Sex, Hormones, and Epilepsy	Catherine Christian-Hinman	
October 6 and 8	The Functional Connectome	Sepideh Sadaghiani	
October 13 and 15	Attention and Sensory Processing	Howard Gritton	
October 20 and 22	Neuromuscular Junction	Martha Gillette	
October 27 and 29	Tools for Connectome Mapping	Boxuan Zhao	
November 3 and 5	Epigenetics and Behavior	Paul Bonthuis	

November 10 and 12	Sociogenomics and Neurogenomics	Gene Robinson	
November 17 and 19	Society for Neuroscience Conference	No meeting	
November 24 and 26	Fall Break	No meeting	
December 1 and 3	Graduate Student Presentations		Presenters:
December 8 and 10	Graduate Student Presentations		Presenters: