Georgia Institute of Technology
NEUR 4001: Neuroscience Research Project
Capstone Course, Fall 2026

Class time & location: Lab: M/W 8:00 -10:45 am
Lecture: M/W 11:00-11:50 am
Clough 341

Instructor: Woon Ju Park

Prerequisites: NEUR 3010

Section: C, C01

Instructor and TA office hours and contact information are listed on the Canvas course page.

Course Description & Learning Objectives

The purpose of this course is to familiarize you to the methods and processes used by neuroscientists to generate scientific research. Over the course of the semester, you will gain an understanding of the process of research – from generating research questions, developing a testable hypothesis, evaluating the existing literature, data collection and analysis, interpretation of results, and communicating findings to others in oral and written form. **Our main objective is to increase your confidence in scientific literacy to help you as a consumer and generator of knowledge in life and in your future profession.**

At the end of the semester, you will be able to:

- Articulate strengths and limitations of various research designs
- Locate and utilize primary literature to identify experimental designs and essential background information
- Formulate testable research hypotheses and generate tests or experiments based on operational definitions of variables
- Follow the APA Code of Ethics in the treatment of human and nonhuman participants in the design, data collection, interpretation, and reporting of neuroscientific research and follow proper biosafety procedures
- Evaluate the appropriateness of conclusions derived from research outcomes
- Identify when and where to use specific statistical tests and interpret basic statistical results
- Communicate scientific knowledge in written, graphical, and oral format and recognize importance of accurate reporting of methods and data for replication studies
- Critically evaluate classmates' research design and presentations
- Work collaboratively toward shared research goals

Course Requirements

Required readings

There is no textbook for this course. This syllabus is required reading.

This course introduces you to foundations of research in neuroscience. Readings will be posted on Canvas and should be read before class so that you are prepared to contribute to the class discussion.

Computer and Internet
A computer and a stable internet connection are required to be able to access course materials and to submit assignments. Please contact us if you need any assistance in accessing the course.

Communication
This class will communicate via Canvas and through your Georgia Tech email address. Please check your GT email address regularly so you do not miss any updates and announcements. **If not emailing directly via Canvas, please indicate your course and section number in the subject line.** The instructor and/or TA will do their best to reply to your emails within 24 hours during the school week. **To stay organized, we will not accept assignments via email**. We would like for you to have a support system for this course, so please communicate with your classmates, instructor, and TA early and often.

Canvas and Student Technology Support
This course utilizes Canvas, a virtual learning management system. Canvas is compatible with all browsers and works with your phone. You may consider downloading the app for your phone to receive notifications and alerts for your courses. Verify your email settings are set to forward your GT email address, and make sure you are receiving emails from the system.

GT Canvas site: https://canvas.gatech.edu/
GT Canvas app for students: https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-is-the-Canvas-Student-app/ta-p/31

Need Microsoft Office? Get access to the FREE cloud-based version of Office 365 by visiting the GT Office 365 website and using your GT email address.
GT Office 365 Website: http://portal.office.com

Need tech help? Contact the Office of Instructional Technology with any technology questions or connect in the Virtual Help Desk.
Office of Instructional Technology website: https://oit.gatech.edu/
Email: support@oit.gatech.edu
Phone: 404-385-5555

Course Policies

Make-up Policy
Late assignments will lose 10% per day off the final grade and will not be accepted after one week past the due date. For extensive illnesses and emergencies, contact the Office of the Vice President and Dean of Students who can inform and work with your instructors. https://studentlife.gatech.edu/request-assistance

Federal Regulations on financial aid require all faculty to document last date of attendance for students who are not participating in classes. If a student has stopped participating in class, then the student's name must be sent to the Dean of Students. If prolonged illness or death in the family occurs, speak with the instructor about withdrawing from the class. In extreme conditions an incomplete may be approved at the discretion of the instructor using guidelines outlined by the Office of the Registrar.

Attendance Policy
This course is a hands-on lab course, and students are expected to fully participate and engage each week. In-class participation is calculated as part of your final grade (see grading table below). The instructor will work with students who have obtained Institute Approved Absences (IAAs) or official documentation from the Dean of Students to provide reasonable accommodations for missed work when possible.

Course Engagement
Student engagement in coursework and class activities is essential for learning and student success. In addition, to comply with federal mandates related to financial aid, the university is required to track attendance and engagement in course activities. Meaningful engagement in a course goes beyond logging into Canvas and may include engaging with learning materials, participating in learning activities, completing assessments, and interacting with classmates and/or the instructor. You are expected to be actively engaged in the course activities explained in this syllabus, just as the instructor and TA promise to be actively engaged, as well. To maintain professionalism and ensure positive interactions and continued collaboration within your group, it is critical that you communicate timely with your group members to inform them of any absence or tardiness.

Academic Honesty and Integrity
Your instructors take academic integrity very seriously. Cheating, in any form, interferes with your success. As science is collaborative by nature, you are absolutely permitted to discuss ideas, results, and work with other people. However, **all work you submit must be your own and in your own words**. If you turn in another's work as your own, **including AI-generated material**, you should expect a failing grade for the course. Work on individual assignments should be done independently. If you have any questions about anything, please do not hesitate to reach out to the instructor or TA. We are here to help!

Policy on use of generative AI for class work
AI-based assistance, such as ChatGPT or Copilot, is considered unauthorized collaboration in this course when used in lieu of writing and interpreting in your own words. In your assignments, avoid anything that was not written directly by you. Including anything you did not write in your assignment without proper citation will be treated as an academic misconduct case and will be reported to the Office of Student Integrity. Use any interaction with an AI assistant as a *tool* to promote your learning experience, with your completed submitted product reflecting your interpretation and understanding of the material. https://www.cc.gatech.edu/news/new-policies-navigate-role-ai-assistants-cs-courses

GT Academic Honor Code
Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct. Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Georgia Tech Values Statement
At Georgia Tech, we see different backgrounds and perspectives as essential to learning, discovery, and creation. We strive to remove barriers to student success, and to build a welcoming community where everyone has the opportunity to contribute to our mission. As outlined in our strategic plan

(https://strategicplan.gatech.edu/values), we want to create an environment of holistic learning where all individuals can grow and learn to lead healthy, purposeful, impactful lives.

Student-Faculty Expectations Agreement
At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Accommodations for Students with Disabilities
If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment of achievement, please notify me as soon as possible so we can resolve the issue. Students with disabilities should also contact the Office of Disability Services (ODS), whose purpose is to collaborate with students, faculty, and staff to create a campus environment that ensures all students have an equal opportunity to access the Georgia Tech community. ODS can be reached at 404.894.2563, dsinfo@gatech.edu, or https://disabilityservices.gatech.edu. Please contact me ahead of time to discuss any issues related to disabilities. I am happy to work with you.

Office of Disability Services:
Smithgall Student Services Building
Email: dsinfo@gatech.edu
Phone: 404-894-2563
Website: http://disabilityservices.gatech.edu/

How to succeed in this class

Science is collaborative, innovative, and also kind of hard sometimes! Experiments do not always go as planned, and we should never set out to "prove" our hypotheses. Negative data, confusing data, no data – these are all possible (if not, probable) outcomes for some of our experiments this semester. Your success in this class will not be judged by the outcome of your experiments, but by your participation, creativity, determination, and communication. We will work together throughout the semester, and your success will depend on your willingness to engage deeply with the research and work in collaboration with your partners.

Category	Assignment	Points	Format
Final Deliverables	Final Manuscript	**20**	Individual
	Final Project Presentation	**10**	Group
Project Development	Annotated Bibliography	**10**	Group
	Journal Club Presentation	**5**	Group
	Written Proposal	**10**	Individual

Category	Assignment	Points	Format
	Proposal Presentation	**5**	Group
	Draft: Introduction/Methods	**5**	Individual
	Draft: Results/Figures	**5**	Individual
Technical Knowledge	MRI Quiz	**10**	Individual
Engagement	Team Contract/Worksheets/Reflections	**10**	Individual
	Attendance/Participation	**10**	Individual
Total		**100**	

Grading Scale
Your final grade will be assigned as a letter grade according to the following scale:

A 90-100
B 80-89.99
C 70-79.99
D 60-69.99
F 0-59.99

Extra Credit
If an extra credit opportunity arises, we will inform you. **To be fair to all students, we cannot offer extra credit to an individual student that has not been offered to the entire class.**

Proposed Schedule will be posted on Canvas and is subject to change; any changes will be posted on Canvas and announced in class.

Assessment of your learning

Research Project: Throughout the semester, you will complete a neuroscience research project as part of a team of 2–5 students. This project is the central component of the course and is designed to guide you through the full research process—from developing a question to communicating your findings.

Your work will culminate in ***a final APA-style manuscript (individual)*** and ***a final presentation (group)***. All other assignments are designed to support the development of this final project through structured milestones.

Final Deliverables
Final Manuscript (individual): The final manuscript is the primary assessment of your learning in this course. You will integrate your research question, literature review, methods, results, and interpretation into a complete APA-style paper, including citations and references.

Final Presentation (group): Each group will deliver a 20-minute presentation of their project, including background, hypothesis, methods, results, and interpretation.

Project Development Milestones
These assignments are designed to scaffold your final project.

Early Project Development
Research Idea and Team Contract (group): In 2–4 sentences, describe your research question, testable hypothesis, and predictions. You will submit a team contract outlining expectations for collaboration.

Annotated Bibliography (group): Develop a bibliography with at least 10 scientific articles as a group. For each source, write 1-2 sentences including a summary and its relevance to your project. Summaries may be in bullet form. This will form the foundation for your introduction.

Journal Club Presentation (group): Pair a foundational paper (chosen by the instructor and the TA) with a recent paper of your choice from the Annotated Bibliography. Present and critically evaluate them, identifying their relevance to your project and the conceptual gaps in the field.

Proposal Stage
Written Proposal (individual) + Proposal Presentation (group): You will develop and present your proposed study, including research question, hypotheses, background, methods, expected results, and limitations in both written (individual; 600 words) and oral (group; 20 minutes) formats. The entire class will engage in providing constructive feedback.

Manuscript Development
Draft: Introduction & Methods (individual): Submit a draft of your Introduction and Methods sections. This is an opportunity to refine your research framing and design before the final manuscript.

Draft: Results & Figures (individual): Submit your Results section with figures. This focuses on clear data presentation and interpretation.

Technical Knowledge
MRI Quiz (individual): This quiz assesses your understanding of key concepts necessary for interpreting neuroimaging methods used in research.

Engagement & Participation
Worksheets/Reflections (individual): You will complete short reflections throughout the semester (approximately 300 words each), including expectations for the course and final learning reflection. For MRI labs, there will be worksheets you will submit related to the technical knowledge you have learned.

Participation (individual): Active participation is essential in this research-based course. This includes attending lectures and lab sessions, engaging with your group, and contributing to discussions.

Academic and Personal Support

APA Style resource: http://owl.english.purdue.edu/owl/resource/560/01/

Center for Academic Success: http://success.gatech.edu

- 1-to-1 tutoring: https://success.gatech.edu/tutoring/
- Peer-Led Undergraduate Study (PLUS): https://success.gatech.edu/tutoring/plus/
- Academic coaching: https://advising.gatech.edu/academic-coaching
- Communication Center: http://www.communicationcenter.gatech.edu
  - Individualized help with writing and multimedia projects

Student Mental Health and Wellbeing: Georgia Tech is committed to supporting and advancing the mental health and well-being of our students. If you or someone you know has a history of mental health concerns, is having current mental health difficulties, or if you are unsure and would like a consultation, a variety of confidential services are available.

National Suicide Prevention Hotline at 988.

The Office of the Dean of Students: https://studentlife.gatech.edu/dean-students/
Smithgall Student Services Building 2nd floor
Email: studentlife@studentlife.gatech.edu
Phone: 404-894-6367

Counseling Center: http://mentalhealth.gatech.edu
Smithgall Student Services Building 2nd floor
Phone: 404-894-2575
- Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention.
- Their website also includes links to state and national resources.
- *Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at **404-894-2575**.*

Belonging and Student Support: http://belonging.gatech.edu/studentsupport

Students' Temporary Assistance and Resources (STAR): https://star.studentlife.gatech.edu/
- Can assist with interview clothing, food, and housing needs.

Stamps Health Services: https://health.gatech.edu
740 Ferst Dr NW, Atlanta, GA 30332
Phone: 404-894-1420
- Primary care, pharmacy, women's health, psychiatry, immunization and allergy, health promotion, and nutrition

Veteran's Resource Center: http://veterans.gatech.edu/
Phone: 404-385-2067

Georgia Tech Police: 404-894-2500

Non-Discrimination: Georgia Institute of Technology is committed to equal opportunity, a culture of inclusion, and an environment free from discrimination and harassment in its educational programs and employment.

Equal Opportunity, Compliance, and Conflict Management: https://eoc.gatech.edu/
RBI Paper Tricentennial Building, 4th floor
Phone: 404-894-5698