

NEUR 3832 - Neuroscience Undergraduate Classroom Research

Course Description

Undergraduate research conducted under the guidance of a faculty mentor.

Details

Time: Monday and Wednesday; 12:30 – 3:15

Place: Clough 341

Professor: Eric Schumacher

Office: Coon 224

Email: eschu@gatech.edu

Office hours: by appointment

Course Learning Outcomes

- Communication
 - o Uses and understands professional and discipline-specific language
 - o Expresses ideas orally in an organized, clear, and concise manner
 - o Writes clearly and concisely using correct grammar, spelling, syntax, and sentence structure
 - o Demonstrates an ability to interpret, evaluate, and create visual representations of ideas
 - o Communicates scientific knowledge in written, graphical, and oral format and recognize importance of accurate reporting of methods and data for replication studies
- Creativity
 - o Shows ability to approach problems from different perspectives
 - o Uses information in ways that demonstrate intellectual resourcefulness
 - o Effectively connects multiple ideas/approaches

- Autonomy
 - o Demonstrates an ability to work independently and identify when guidance is needed
 - o Accepts constructive criticism and uses feedback effectively
 - o Uses time well to ensure work gets accomplished
 - o Works collaboratively toward shared research goals
- Ability to Deal with Obstacles
 - o Is not discouraged by setbacks or unforeseen events and perseveres when challenges are encountered
 - o Shows flexibility and a willingness to take risks and try again
 - o Troubleshoots problems and searches for ways to do things more effectively
- Intellectual Development
 - o Recognizes that problems are often more complicated than they first appear
 - o Approaches problems with an understanding that there can be more than one right explanation or even none at all
 - o Displays insights into the limits of their knowledge and an appreciation for what isn't known
- Critical Thinking and Problem Solving
 - o Uses a reflective and iterative approach to problem solving
 - o Looks for the root causes of problems and develops or recognizes the most appropriate corrective actions
 - o Recognizes flaws, assumptions, and missing elements in arguments
- Practice & Process of Inquiry
 - o Demonstrates ability to formulate questions and hypotheses within the discipline
 - o Demonstrates ability to properly identify and/or generate reliable data
 - o Shows understanding of how knowledge is generated, validated, and communicated within the discipline.

- Nature of Disciplinary Knowledge
 - o Shows understanding of the criteria for determining what is valued as a contribution in the discipline
 - o Shows awareness of important contributions in the discipline and who was responsible for those contributions
 - o Reads and applies information obtained from professional journals and other sources
- Project Knowledge and Skills
 - o Displays knowledge of key facts and concepts
 - o Displays a grasp of relevant methods and is clear about how these methods apply to the research project
 - o Demonstrates an appropriate mastery of skills needed to conduct the project
- Ethical Conduct
 - o Shows understanding of the importance of principles of Responsible Conduct of Research (RCR)
 - o Follows 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
- Electroencephalography (EEG) knowledge
 - o Learn to collect, analyze, and interpret EEG data

Required Course Materials

There is no textbook for this class.

Student-Faculty Expectations

Faculty research mentors and students will discuss and agree on expectations before beginning an undergraduate research course. Expectations will include the student's weekly time commitment; methods and frequency of communication between the student and mentor(s); how research will be recorded, stored, and shared; and when and how students will reflect on

their successes and challenges. All students conducting neuroscience research at Georgia Tech are required to do the following:

- Project work – 60%
- Literature Review – 15%
- Presentation – 15%
- Research Reflection – 10%

Grades will be determined based on the following scale:

90% – 100%	= A
80 %– 89%	= B
70% – 79%	= C
60% – 69%	= D

The above grading scheme represents the toughest I will grade. However, the cutoffs for grades might be relaxed depending on the proportion of students achieving each grade. This rarely happens.

Attendance Policy

Undergraduate research students will participate in research activities on a weekly basis commensurate with registered credit hours and as discussed with faculty research mentors. Students earning research credit are expected to commit approximately 3hr of lab-related work per credit hour earned. This includes all in-person or remote lab work, meetings, readings, writing, and any other work that is directly related to the student's role in the lab.

Academic Honor Code

<https://osi.gatech.edu/students/honor-code>

Article II: Section 3. Student Responsibilities

Section 3. Student Responsibilities

Students are expected to act according to the highest ethical standards. The immediate objective of an Academic Honor Code is to prevent any Students from gaining an unfair advantage over other Students through academic misconduct. The following clarification of academic misconduct is taken from Section XIX Student Code of Conduct, of the Rules and Regulations section of the Georgia Institute of Technology General Catalog: Academic misconduct is any act that does or

could improperly distort Student grades or other Student academic records. Such acts include but need not be limited to the following:

- **Unauthorized Access: Possessing, using, or exchanging improperly acquired written or verbal information in the preparation of a problem set, laboratory report, essay, examination, or other academic assignment.**
- Unauthorized Collaboration: Unauthorized interaction with another Student or Students in the fulfillment of academic requirements.
- **Plagiarism: Submission of material that is wholly or substantially identical to that created or published by another person or persons, large language model/artificial intelligence, or yourself, without adequate credit notations indicating the authorship.**
- False Claims of Performance: False claims for work that has been submitted by a Student.
- Grade Alteration: Alteration of any academic grade or rating so as to obtain unearned academic credit.
- Deliberate Falsification: Deliberate falsification of a written or verbal statement of fact to a Faculty member and/or Institute Official, so as to obtain unearned academic credit.
- Forgery: Forgery, alteration, or misuse of any Institute document relating to the academic status of the Student.
- Distortion: Any act that distorts or could distort grades or other academic records.

While these acts constitute assured instances of academic misconduct, other acts of academic misconduct may be defined by the professor.

Statement of Inclusivity

Class discussion is critical for the success of this course. There may be topics for which we do not all agree. We must endeavor to be respectful of others as we present our ideas and as we listen to others' ideas. I am committed to creating a learning environment in which all of students feel safe and included. I will monitor the discussion to ensure this. I also rely on your feedback to achieve this goal. To that end, I invite you to talk with us about things that we can stop, start, or continue doing to make the classroom an environment in which every student feels valued and can engage actively in our learning community.

Disability Services Accommodations Procedures for Students

Georgia Tech complies with regulations of the Americans with Disabilities Act of 1990 and offers accommodations to students with disabilities. If you need a classroom accommodation, please make an appointment with the Office of Disability Services to discuss the appropriate procedures. Please email me as soon as possible to discuss your learning needs. Their website is www.adapts.gatech.edu. Up-to-date listing of student recourses are available in the GT Student Resources link on Canvas.