

# CHEM 4699 | Undergraduate Research

Evans Group | SEMESTER

## Instructor Information

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Instructor: Dr. Michael Evans ([mevans@gatech.edu](mailto:mevans@gatech.edu))

## General Course Information

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### Description

Undergraduate research conducted under the guidance of a faculty mentor.

Welcome to the Evans research group! Our group is focused on educational research in collegiate introductory and organic chemistry courses. Activities of the group include:

- Development and implementation of instructional interventions aimed at improving student learning
- Assessment and evaluation of instructional innovations via both quantitative and qualitative approaches:
  - Development and administration of surveys
  - Student interviews
  - Ethnographic observation of students and instructors in the classroom

My primary motivation is helping *you* develop as an instructional designer or educational researcher. To facilitate this, we will meet weekly for no more than 30 minutes at an agreed-upon time to check in on your project.

### Course Learning Outcomes

- Communication
  - Uses and understands professional and discipline-specific language
  - Expresses ideas orally in an organized, clear, and concise manner
  - Writes clearly and concisely using correct grammar, spelling, syntax, and sentence structure
  - Demonstrates an ability to interpret, evaluate, and create visual representations of ideas
- Creativity
  - Shows ability to approach problems from different perspectives
  - Uses information in ways that demonstrate intellectual resourcefulness

- Effectively connects multiple ideas/approaches
- Autonomy
  - Demonstrates an ability to work independently and identify when guidance is needed
  - Accepts constructive criticism and uses feedback effectively
  - Uses time well to ensure work gets accomplished
- Ability to Deal with Obstacles
  - Is not discouraged by setbacks or unforeseen events and perseveres when challenges are encountered
  - Shows flexibility and a willingness to take risks and try again
  - Troubleshoots problems and searches for ways to do things more effectively
- Intellectual Development
  - Recognizes that problems are often more complicated than they first appear
  - Approaches problems with an understanding that there can be more than one reasonable explanation or even none at all
  - Displays insights into the limits of their knowledge and an appreciation for what isn't known
- Critical Thinking and Problem Solving
  - Uses a reflective and iterative approach to problem solving
  - Looks for the root causes of problems and develops or recognizes the most appropriate corrective actions
  - Recognizes flaws, assumptions, and missing elements in arguments
- Practice & Process of Inquiry
  - Demonstrates ability to formulate questions and hypotheses within the discipline
  - Demonstrates ability to properly identify and/or generate reliable data
  - Shows understanding of how knowledge is generated, validated, and communicated within the discipline
- Nature of Disciplinary Knowledge
  - Shows understanding of the criteria for determining what is valued as a contribution in the discipline
  - Shows awareness of important contributions in the discipline and who was responsible for those contributions
  - Reads and applies information obtained from professional journals and other sources
- Project Knowledge and Skills
  - Displays knowledge of key facts and concepts

- Displays a grasp of relevant methods and is clear about how these methods apply to the research project
- Demonstrates an appropriate mastery of skills needed to conduct the project
- Ethical Conduct
  - Shows understanding of the importance of principles of Responsible Conduct of Research (RCR)
  - Employs best practices with regards to all safety considerations relevant to their research, including the completion of all relevant safety training courses offered by Georgia Tech

### **Required Course Materials**

There are no required materials for this course.

### **Grading Policy**

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

- A 90.0 – 100%
- B 80.0 – 89.9%
- C 70.0 – 79.9%
- D 60.0 – 69.9%
- F Less than 60.0%

This will be done based on the faculty members' assessment of your participation and engagement in the research along with your demonstration of the course learning outcomes, at a level appropriate for your research experience and project, during your activities (80%), your project final report (10%), and your project presentation slide deck (10%).

### **Description of Graded Components**

A final report is required and will be due on the final instructional day (**DATE**). The general spirit of this report is to provide a record of the work you have completed and relevant context—including background information, prior work and references, and the like—that could help a future student take over your project confidently. I will provide a template for the report but I encourage you to communicate with me if the template feels irrelevant. Some sections may not be relevant to some projects.

An oral presentation is also required. This presentation (10 minutes in length with an additional 3 minutes for questions and answers) should focus on the work you carried out throughout the term, with relevant background information and theory. Your presentation will be given to the rest of the group; we may also schedule a presentation to other CHEM 4699 students. A copy of your slides should be submitted to the general CHEM 4699 Canvas site by **DATE**.

**Failure to submit a final report or a slide deck via Canvas will result in a decrease of your course grade.** Each missing assignment will result in a deduction of one letter grade. I will communicate your course grade via an evaluation emailed during finals week.

## Course Policies

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### Attendance and/or Participation

Undergraduate research students will participate in research activities on a weekly basis commensurate with registered credit hours and as discussed with faculty research mentors. For a 3-credit course, approximately 9 hours per week of project-related effort is expected.

### Academic Integrity

Students are expected to maintain the highest standards of academic integrity. All work submitted must be original and properly cited. Plagiarism, cheating, or any form of academic dishonesty will result in immediate consequences as outlined in the university's academic honor code: <https://policylibrary.gatech.edu/student-life/academic-honor-code>

### Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, [contact the Office of Disability Services](#) (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

### 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.

## Campus Resources for Students

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The Undergraduate Research Opportunities Program (UROP) provides resources and support for undergraduate research students and their mentors. Visit <https://undergradresearch.gatech.edu/> or contact UROP at [urop@gatech.edu](mailto:urop@gatech.edu) for more information.