PHYS2698/2699/4698/4699 – Undergraduate Research Assistantship: Syllabus

What is undergraduate research? Broadly, undergraduate research is a research, scholarly, or creative project conducted by an undergraduate student under the guidance of a faculty mentor that contributes new knowledge and/or discoveries to the broader professional community.

Why is undergraduate research important? Undergraduate research is a recognized high-impact practice and an important transformative learning experience for students. High-quality mentored research experiences build confidence, foster deeper understanding, and enhance personal and professional development.

Below are the syllabus elements required by the University System of Georgia (https://www.usg.edu/academic_affairs_handbook/section2/C757)

Course Prefix and Number

- Course prefix: PHYS
- Course numbers: https://undergradresearch.gatech.edu/register
    - 2698: (audit) paid or volunteer research for freshman and sophomore students
    - 2699: graded academic credit research for freshman and sophomore students
    - 4698: (audit) paid or volunteer research for junior and senior students
    - 4699: graded academic credit research for junior and senior students

Course Name

- PHYS2699: Undergraduate Research
- PHYS4699: Undergraduate Research
- PHYS2698: Undergraduate Research Assistantship
- PHYS4698: Undergraduate Research Assistantship

Instructor First Name
John

Instructor Last Name
Wise

Section
Wise

CRN

- PHYS2699: 81212
- PHYS4699: 83138
- PHYS2698: N/A
- PHYS4698: 81229

Semester
Fall

Academic Year
2026-2027

Course Description
Undergraduate research conducted under the guidance of a faculty mentor.

Course Learning Outcomes
Below are learning outcomes associated with high-quality mentored undergraduate research experiences (adapted from Singer et al. 2022). These learning outcomes are broadly applicable across disciplines and define academic and professional knowledge and skills acquired during undergraduate research. Faculty research mentors may select some or all of these learning outcomes to emphasize with their undergraduate researchers, adapt these learning outcomes to reflect their pedagogical approach to undergraduate research, and/or develop different learning outcomes specific to their research program.

- 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 right 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)

<u>Required Course Materials</u>
None.

<u>Statement About Acceptable Student Conduct</u>
Faculty research mentors and students should discuss and agree on expectations before beginning an undergraduate research course. Expectations should 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. 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.

To support mutual respect and understanding between students and faculty, Georgia Tech faculty and students collectively adopted a list of student-faculty expectations. See the full Student-Faculty Expectations agreement here: https://catalog.gatech.edu/rules/22/

Grading Policy

Specify how final grades will be determined, including weighting scales or points assigned to various course requirements. Your grading process and scoring methods should be clearly stated, allowing students to reasonably predict progress towards their final grade throughout the semester. Finally, you should define your approach to calculating course grades, including how assignments are weighted, so that students can clearly see the ways in which their work and grades earned along the way will contribute to their final grade in the course.

- PHYS2699: Letter grade
- PHYS 4699: Letter grade
- PHYS 2698: Visitor (V) or Withdrawn (W)
- PHYS 4698: Visitor (V) or Withdrawn (W)

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.

Academic Honesty/Integrity Statement

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.

Campus Resources

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 for more information.