AE4699 – Undergraduate Research: Syllabus

Instructor Name: Karen Feigh
The primary faculty mentor overseeing the undergraduate research course.
Update as needed

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)

Required Course Materials
None

Statement About Acceptable Student Conduct
Student and faculty will meet regularly throughout the semester to review project goals and progress. At the end of the semester the student will submit a short report about their work on the project over the course of the semester.

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

- A: Perform the work assigned on the project to the best of your ability and contribute meaningfully to the project by showing up on time and putting in the level of effort associated with the credit hours taken.
- B: Perform the work assigned on the project to the best of your ability. Show up to 80% of time and activities agreed upon and associated with the credit hours taken.
- C: Perform the work assigned poorly. Show up irregularly with no explanation. Do not perform activities agreed upon, or with work amount significantly below those associated with credit hours taken.

Attendance Policy

Undergraduate research students will participate in research activities on a weekly basis commensurate with registered credit hours and as discussed with research group members and 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.