SYLLABUS

EAS 8901 Special Problems
Fall 2026

Instructor: Dr. Isaiah W. Bolden (he/him)

Course Description: This course is for students enrolled in the BS/MS option in Earth and Atmospheric Sciences at Georgia Tech who wish to conduct capstone research under the supervision of Dr. Isaiah Bolden.

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 adapted for BS/MS students and broadly applicable across disciplines and define academic and professional knowledge and skills acquired during undergraduate research. Faculty research mentors may select some or all these learning outcomes to emphasize with their student researchers, adapt these learning outcomes to reflect their pedagogical approach to undergraduate research, and/or develop different learning outcomes specific to their research program:

- o 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
- o Creativity
  - § Shows ability to approach problems from different perspectives
  - § Uses information in ways that demonstrate intellectual resourcefulness
  - § Effectively connects multiple ideas/approaches
- o 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
- o 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
- o 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
- o 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
- o 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
- o 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
- o 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
- o Ethical Conduct
    - § Shows understanding of the importance of principles of Responsible Conduct of Research (RCR)

Required Course Materials: No textbooks or materials are required. Resources for research are determined in consultation with the research advisor.

Grading Policy: Grades are assigned based on satisfactory progress on research efforts and career development. A grade of A indicates that the student has made exemplary progress in their research consistent with the number of research credit hours for which the student is enrolled for the semester. A grade of B reflects satisfactory progress; C reflects minimal progress; so on and so forth.

Attendance Policy: This course does not include scheduled class meetings. Students conduct independent research under the supervision of a research advisor. The frequency and format of student– advisor contact are determined by mutual agreement.

Academic and Research Honesty/Integrity Statement: 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 the Student Code of Conduct and the

Academic Honor Code, especially Appendix A: Graduate Addendum to the Academic Honor Code.

Students are expected to perform research in an ethical and responsible manner. All Doctoral and Masters Thesis students are required to take the Responsible Conduct of Research training, and it is expected that students abide by the principles taught in that training while performing research for this thesis course.

Allegations of scientific or scholarly misconduct are handled in accordance with the procedures outlined by the Policy for Responding to Allegations of Scientific or Other Scholarly Misconduct.

Core IMPACTS: Not applicable.

Accommodations for Students with Disabilities: If you are a student with learning needs that require special accommodation, contact the Office of Disability Services 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.

Expectations of Advisors and Advisees: 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 Expectations of Advisors and Advisees articulates 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.