EAS 9000 Syllabus

Doctoral Thesis — Section AS, CRN 91470

Fall 2026

Instructor Information

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General Course Information

Description

EAS 9000 is the doctoral thesis credit course for students conducting original dissertation research under the supervision of Dr. Ali Sarhadi in the Climate Risk and Extreme Dynamics (CRED) Lab. Students enrolled in this course are engaged in sustained, independent research in one or more of the lab's core areas: Climate AI, Physics-based Machine Learning, and Tropical Cyclone science. The course does not follow a lecture-based format; instead, progress is driven by the student's individual research plan and monitored through regular advising meetings and written reporting throughout the semester. There is no final examination.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

- Design and independently execute original doctoral research in climate science, climate AI, or related fields.
- Apply advanced methods in machine learning, physics-based modeling, and/or data analysis to scientific research questions.
- Critically synthesize primary literature and position their own research within the broader field.
- Communicate doctoral research progress effectively through written reports and oral updates to the thesis advisor.
- Demonstrate rigorous research practices including reproducibility, data integrity, ethical conduct, and proper attribution.

Required Course Materials

There is no required textbook for this course. Students will be directed to relevant journal articles, preprints, technical reports, and software documentation on an ongoing basis. All materials will be shared by Dr. Sarhadi via email and the lab Slack workspace. Students are

expected to maintain access to the computing resources required for their specific research project.

Grading Policy

Final grades are assigned on a Satisfactory/Unsatisfactory (S/U) basis per Georgia Tech doctoral thesis credit policy. Where a letter grade is required, grades are assigned on a scale of A–F (no +/− grades at Georgia Tech). There is no final examination. Grade determination reflects the quality and consistency of research activity, engagement with the advising process, and the completeness of required written reporting throughout the semester:

- Research Participation & Progress — 50%
- Weekly/Bi-Weekly Advising Meetings & Progress Log — 20%
- Written Progress Report #1 (Early Semester) — 10%
- Written Progress Report #2 (Mid-Semester) — 10%
- End-of-Semester Written Summary Report — 10%

Letter Grade Scale (if applicable): A ≥ 90; B ≥ 80; C ≥ 70; D ≥ 60; F < 60

Description of Graded Components

Research Participation & Progress (50%)

This is the primary component of the course and reflects the student's overall engagement, output, and advancement toward dissertation goals. Students are expected to dedicate full-time effort (~40 hours/week) to their doctoral research activities. Evaluation is based on: consistency and quality of work, responsiveness to advisor feedback, independence and problem-solving initiative, and demonstrable forward progress on the dissertation. Progress is assessed through ongoing advising interactions throughout the semester.

Weekly/Bi-Weekly Advising Meetings & Progress Log (20%)

Students must attend all scheduled one-on-one or group advising meetings with Dr. Sarhadi (or a designated postdoctoral supervisor). Prior to each meeting, students should update their progress log with: tasks completed since the last meeting, data collected or results generated, current blockers or open questions, and planned work for the coming period. The log may take the form of a shared document, lab notebook, or equivalent tool agreed upon with the advisor. This log is subject to review at any time.

Written Progress Report #1 — Early Semester (10%)

Submitted approximately 4–5 weeks into the semester. This 1–2 page report should outline: (1) the specific research question(s) and objectives for the semester, (2) the methodology and approach planned, (3) any preliminary work or literature reviewed to date, and (4) a timeline and milestones for the remainder of the semester. The purpose of this report is to establish a clear research plan early and ensure alignment with the advisor.

Written Progress Report #2 — Mid-Semester (10%)

Submitted at the semester midpoint (approximately week 8–9). This 2–3 page report should document: (1) progress made against the plan established in Report #1, (2) results, findings, or

outputs generated to date, (3) any adjustments to the research plan or timeline, and (4) specific goals for the second half of the semester. This report serves as a formal checkpoint to assess whether the semester's research objectives remain on track.

End-of-Semester Written Summary Report (10%)

Submitted during the final week of the semester (no final exam period submission required). This 3–5 page report should summarize the full arc of the semester's research: (1) original objectives, (2) work completed, (3) key results and findings, (4) limitations and open questions, and (5) a forward-looking plan for the next semester. This report serves as a record of doctoral progress and may contribute directly to dissertation chapter drafts.

Additional Criteria for Successful Completion

To successfully complete this course, doctoral students must:

- Maintain full-time research engagement and meet the ongoing commitments agreed upon with the thesis advisor.
- Submit all three written progress reports by their stated deadlines.
- Attend all scheduled advising meetings and maintain an up-to-date progress log throughout the semester.
- Demonstrate forward progress toward dissertation milestones as defined in their individual research plan.
- Uphold all standards of research integrity, data stewardship, and professional conduct as outlined in this syllabus and Georgia Tech's policies.

Course Policies

Attendance and/or Participation

Regular attendance at all scheduled advising meetings and lab group sessions is required. Doctoral research depends on sustained engagement with the advisor and research community. Students must notify Dr. Sarhadi in advance if they cannot attend a scheduled meeting. Unexplained or repeated absences from advising meetings will negatively impact the grade. Students are expected to comply with Georgia Tech's attendance and approved absence policies, including provisions for illness, approved Institute activities, and religious observances.

Academic Integrity

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 Georgia Tech's Honor Code and the student Code of Conduct. In the context of doctoral research, academic integrity requires accurate reporting of data and methods, proper attribution of all sources and collaborators, transparency with the thesis advisor, and compliance with Georgia Tech's research misconduct policies. Any student suspected of data falsification, plagiarism, or other research misconduct will be reported to the Office of Student Integrity.

Core IMPACTS

Core IMPACTS is the University System of Georgia's General Education curriculum. As a doctoral thesis course, EAS 9000 does not typically count toward Core IMPACTS requirements. Contact your academic advisor if you have questions about your degree requirements.

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 Dr. Sarhadi 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 advisor-advisee relationship, this means open and honest communication, timely feedback, respect for each other's time, and a shared commitment to rigorous, ethical scholarship. I encourage you to remain committed to the ideals of Georgia Tech throughout your doctoral training.

Additional Course Policies

Pre- and/or Co-Requisites

Enrollment in EAS 9000 requires formal admission to the doctoral program in Earth and Atmospheric Sciences and assignment of Dr. Sarhadi as thesis advisor. Students are expected to have completed or be concurrently completing required doctoral coursework and to have a foundational background in programming (Python or R) and scientific research methodology.

Collaboration, Group Work, and Use of Generative AI

Doctoral research is collaborative in nature. Students are encouraged to engage with lab group members, collaborators, and the broader research community. All written progress reports submitted for a grade must reflect the student's own analysis, reasoning, and writing. Use of generative AI tools (e.g., ChatGPT, Claude, Gemini) to draft substantial portions of graded reports is not permitted without prior approval and explicit attribution. Use of AI tools for literature discovery, code generation, data analysis, or language editing is permitted but must be disclosed. When in doubt, discuss with Dr. Sarhadi before submitting.

Extensions, Late Reports, and Missed Meetings

Written progress reports submitted late without prior approval will be penalized 10% per day. If extenuating circumstances arise (illness, approved Institute activities, conference travel, religious observances), notify Dr. Sarhadi as early as possible. Requests for extensions made

after a deadline has passed will be evaluated on a case-by-case basis. Doctoral students are expected to communicate proactively about scheduling challenges rather than allowing them to escalate.

Campus Resources for Students

Graduate Student Academic and Professional Success Resources

Resources for doctoral students — including academic support, professional development, funding, and student services — are available through the Office of Graduate and Postdoctoral Education (gradpostdoc.gatech.edu), including information on dissertation requirements, academic resources, and career development.

Student Well-Being

Doctoral training can be demanding, and Georgia Tech is committed to supporting your overall physical, social, and mental well-being. A comprehensive list of wellness-related resources is maintained by the Office of the Vice President for Student Engagement and Well-being in the Student Resource Guide (students.gatech.edu/student-resource-guide). Students are strongly encouraged to use these resources and to reach out to Dr. Sarhadi if challenges arise that are affecting their research or well-being.