VIP: Fire Research and Innovations

Course Information

- **Instructor:** Yuhang Wang (yuhang.wang@eas.gatech.edu)
- **Course Prefix and Number:** VIP 2601/3601/3602/4601/4602/6601/6602/6603
- **Term:** Spring 2027

Course Description

This course explores wildfire risk, monitoring, and management in the Southern United States, emphasizing the region's unique climate, ecological, and social vulnerabilities and its growing exposure under climate change. Students will examine advanced fire monitoring and forecasting tools, including integrated observational systems, predictive and AI-enabled models, and decision-support frameworks that connect real-time data with long-term projections. The course also addresses challenges in interagency coordination, public awareness, and community preparedness, highlighting the role of customized solutions, stakeholder collaboration, education, and outreach in improving prevention, response, and resilience to wildfire impacts.

Course Learning Outcome

- Define and scope a semester-long, team-based research project aligned with fire monitoring, forecasting, and management objectives.
- Collaborate effectively within a structured subteam environment, assuming technical and/or leadership roles to plan, execute, and document project activities.
- Design, develop, and evaluate data products, predictive models, or integrated systems that support wildfire monitoring, forecasting, and decision-making.
- Apply sprint-based project management practices to set goals, track progress, communicate results, and iteratively refine technical and organizational outcomes.
- Assess the effectiveness of wildfire prevention and mitigation strategies using data-driven and stakeholder-informed approaches.
- Communicate technical progress and results through clear documentation, presentations, and shared collaboration platforms.
- Demonstrate professional responsibility through consistent participation, peer collaboration, self-reflection, and constructive evaluation of team contributions.

Required Course Materials

No textbooks or materials are required. Resources for research are determined in consultation with the instructor.

Grading Policy

- 15%: Mid-semester peer evaluation

- 15%: Mid-semester logbook
- 15%: Mid-semester attendance
- 15%: End-semester peer evaluation
- 15%: End-semester logbook
- 15%: End-semester attendance
- 10%: End-semester documentation and deliverables

Grade scale

- >=90%: A
- >=80%: B
- >=70%: C
- >=60%: D
- <60%: F
- Grades will not be rounded

Peer evaluation grading rubric

- 100%: Student has been identified an exemplary contributor by their peers. Student is proactively solving problems and committing time. Student is active in cross-subteam communications. Student has made excellent and useful comments on their peers during peer evaluations.
- 90% Student has been identified as an excellent contributor by their peers. Student is mostly proactive when solving problems. Student helps some with cross-subteam communications. Student has made many useful comments on their peers during peer evaluations.
- 80% Student is a solid, but unspectacular contributor to their subteam. Student making effort to solves problems but generally needs to be told what to do next. Student generally does not participate in cross-subteam communications. Student has made a limited number of useful comments on their peers during peer evaluations.
- 70%: Student is a below-par contributor to their subteam. Student not making sufficient effort to solve problems, and/or failing to communicate status to subteam leader. Student has made few useful comments on their peers during peer evaluations.
- 60%: Student is making little effort toward contributions to the subteam. Student has made no useful comments on their peers during peer evaluations.
- 50%: Student is making no effort toward contributions to the subteam. Student has not participated in peer evaluations.

Logbook and deliverables grading rubric

- 100%: Weekly progress entries in logbook are consistent and timely. Includes clear description of individual work performed and milestones achieved during the week.

Always includes references toward the overall semester goal, and progress toward it. Includes a smaller goal for the upcoming 1-2 weeks. Includes things like to-do lists where appropriate

- 90%: Weekly progress entries in logbook are mostly on time. Usually includes clear description of individual work performed and milestones achieved during the week. Usually includes references toward the overall semester goal, and progress toward it. Usually includes a smaller goal for the upcoming 1-2 weeks. Often things like to-do lists where appropriate
- 80%: Weekly progress entries in logbook are sometimes late. Sometimes, a clear description of individual work performed and milestones achieved during the week is missing. Sometimes includes references toward the overall semester goal, and progress toward it. Sometimes includes a smaller goal for the upcoming 1-2 weeks. Things like to-do lists where appropriate are often absent.
- 70%: Weekly progress entries in logbook are sometimes missed. Clear descriptions of individual work performed and milestones achieved during the week are often missing. References to overall semester goal and progress are often missed.
- 60%: Weekly progress entries in logbook are mostly missed. Clear descriptions of individual work performed and milestones achieved during the week are usually missing. References to overall semester goal and progress are usually missed.
- 50%: Weekly progress entries logbook are nonexistent. No descriptions of individual work performed and milestones achieved during the week. References to overall semester goal and progress are nonexistent

Attendance Policy

Regular and active participation is essential to the success of this team-based VIP course. Students are expected to attend all weekly full-team meetings and all scheduled subteam meetings. Attendance will be taken for both and contributes directly to the course grade as outlined in the grading scheme. In addition to being physically or virtually present, students are expected to arrive prepared, engaged, and ready to contribute to discussions and activities.

If a student must miss a meeting due to a significant and unavoidable reason (e.g., illness, family emergency, required academic obligation), they are expected to notify the instructor in advance for full-team meetings or notify their subteam lead in advance for subteam meetings via MS Teams direct message. When advance notice is not possible, communication should occur as soon as reasonably feasible. Repeated unnotified absences, late arrivals, or early departures may be treated as absences.

Students who miss meetings are responsible for catching up on missed content, decisions, and action items, and for coordinating with their subteam to ensure continuity of work. Because this course depends heavily on collaboration, persistent absences or disengagement may negatively

affect both attendance grades and peer evaluations. Excessive absences may result in a significant reduction in the final course grade, regardless of technical contributions.

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.

Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

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

This course satisfies the USG Core IMPACTS goals by engaging students in an interdisciplinary, problem-based learning environment focused on real-world wildfire monitoring, forecasting, and management challenges. Students integrate knowledge from atmospheric science, data analytics, and social systems while working collaboratively in structured teams to design and implement practical solutions. Through iterative sprints, technical deliverables, stakeholder-informed problem framing, and clear communication of results, students develop critical thinking, teamwork, and civic awareness while applying their learning to issues that directly affect community safety, environmental resilience, and public preparedness.

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 accom- modations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Acceptable Student Conduct

We are committed to fostering an academic environment grounded in mutual respect, professionalism, and shared responsibility between students and faculty. This course adheres to the principles outlined in the Student-Faculty Expectations Agreement, which articulates the

standards of conduct, communication, and engagement expected of all members of the academic community. Students are expected to demonstrate respect for diverse perspectives, contribute constructively to collaborative work, and maintain integrity, accountability, and professionalism in all interactions. By honoring these shared expectations and valuing knowledge, hard work, and respectful discourse, we collectively help create a productive, inclusive, and supportive learning environment consistent with the ideals of Georgia Tech.

Campus Resources for Students

Undergraduate Student Academic Success Resources:
A list of resources for undergraduate students' academic success and information about advising can be found at Success at Tech.

- 1:1 Tutoring: Students looking for additional assistance outside of the classroom are advised to consider working with a peer tutor through Knack. Georgia Institute of Technology has partnered with Knack to provide students with access to verified peer tutors who have previously aced this course. To view available tutors, visit gatech.joinknack.com and sign in with your student account.

Graduate Student Academic and Professional Success Resources:
A list of resources for graduate students is given on the Office of Graduate and Postdoctoral Education website. Specific information for current graduate students includes

- Academic Resources such as the Communications Center, Language Institute, Library, Catalog, Registrar, resources for conducting research, Advocacy and Conflict Resolution resources, and how to manage unexpected situations that may impact your academic performance;
- Student Resources such as Campus Services, Child Care/Family programs, Health & Wellness, Career Services, and the Student Resource Guide; and
- Professional Development such as the programming from the Career Center and other professional development resources and events"]

Student Well-Being:
At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A comprehensive list of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being (student-resource-guide (gatech.edu)