

Infrastructure Systems

Course Information

Instructor: Adair Garrett (adairgarrett@gatech.edu)

Course Prefix and Number: CEE 6651 A

Term: Fall 2026

Course Description

This course has three main objectives; (1) examine the IAM body of knowledge and practice; (2) review the emerging infrastructure resilience body of knowledge; and (3) apply this knowledge to solve real-world problems with an IAM framework. We will examine funding, valuation, performance modeling, project prioritization, vulnerability and sustainability assessment, resilience assessment, and emerging technologies as we develop and apply our knowledge of infrastructure systems. The term project will give you an opportunity to develop, revise, and evaluate grant proposals to address one or more compelling needs for resilience building at the local, metropolitan, state, or national level. Through course instruction, in-class discussions, directed readings, guest lectures, and team-based work, we will learn about what it takes to develop more resilient infrastructure, with rail and public transit systems as the focus of this semester.

Course Learning Outcomes

1. Complex Analysis

- o An ability to analyze complex real-world systems using various quantitative and qualitative tools, including benefit-cost analysis, multi-criteria decision analysis, performance measurement, sustainability assessment, vulnerability and resilience assessment, and others.

2. Adaptive Communication Skills

- o An ability to communicate effectively with a wide range of audiences through multiple communication channels (e.g., visual, oral, written) and, when necessary, spontaneously.

3. Teaming/Leadership

- o An ability to function effectively in a team within a collaborative and inclusive environment, where team members are collectively able to communicate opinions and needs, establish goals, plan tasks, and meet objectives.

4. Lifelong Learning and Research Skills

- o An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Required Course Materials

1. Coffelt, D., and C. Hendrickson. **Fundamentals of Infrastructure Management**. 3rd Edition, 2019, <https://doi.org/10.1184/R1/5334379.v2>.
2. Marchau, V. A. W. J., W. E. Walker, P. J. T. M. Bloemen, and S. W. Popper. (Eds.). **Decision Making under Deep Uncertainty. From Theory to Practice**. The Society for Decision Making under Deep Uncertainty. Springer, Switzerland, 2019. https://galileo-gatech.primo.exlibrisgroup.com/permalink/01GALI_GIT/1plii6l/alma9914422101902947
3. The National Academies. **Disaster Resilience – A National Imperative**. The National Academies Press, 2012. [Background Reading]

Grading Policy

This course is graded through four homework assignments (20%); a midterm exam (30%); a term project with a written submission and oral presentation (30%); and active participation in classes and group exercises (20%). Grades will be regularly updated throughout the semester to allow reasonable monitoring of progress towards the final grade. Specific feedback on assignments and performance will be provided via Canvas to support student learning. If the student has doubts, they are welcome to reach out to the instructor for additional feedback or information.

Attendance Policy

The class meets for a single 2-hour-45-minute session each week. Attendance is expected throughout the semester and is required for the project oral presentations.

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](#).

Core IMPACTS

Not applicable

Accommodations for Students with Disabilities

Georgia Tech complies with the regulations of the Americans with Disabilities Act of 1990 and offers students with disabilities accommodations. 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 email me early in the semester to set up a time to discuss your learning needs.

Student-Faculty Expectations

At Georgia Tech, we strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and students. [The Student-Faculty Expectations](#) articulates some basic expectations for students and faculty members. We will work together this semester to create a respectful and enjoyable environment where we can learn from and with each other.

Campus Resources

In addition to joining pre-determined instructor office hours, students are welcome to make office hour appointments at times that work well for them throughout the week (generally between 9am and 7pm ET, Monday through Friday). This is to accommodate students who may have work, research, or other commitments during the scheduled office hour periods. Students are welcome to schedule appointments to discuss the course or other elements of graduate school. To the extent possible, the instructor will share other resources to support the students' needs.