CEE 7760 Syllabus

Transportation Network Modeling and Analysis, Section: A, 3 Credits

Fall 2026

Instructor Information

Instructor: Srinivas Peeta

General Course Information

Description

Transportation is in its most transformative and disruptive phase in over a century. Catalyzed by technologies associated with communication, automation and electrification, the implications for innovations in the movement of people and goods are profound. Many of them will manifest as impacts at the system level and can be modeled and analyzed using networks. This course will discuss concepts for the planning, design, operation, and control of transportation networks. The focus is on system-level modeling of traffic network components and their interactions, prediction and optimization of network performance, and network dynamics and stochasticity. The course will also highlight emerging network problems associated with connectivity, autonomy, and mobility-as-a-service in the network modeling context. Further, it will discuss some emerging methods (such as machine learning) to solve network problems.

Course Learning Outcomes

Upon successful completion of this course, you should be able to:

- Explain the systems approach and model transportation systems as networks.
- Model and analyze transportation network problems with static characteristics.
- Model and analyze transportation network problems with dynamic characteristics.
- Model network problems arising from emerging technologies and modes.
- Analyze and solve network problems using emerging methods (such as AI/ML).

Prerequisites

Undergraduate level knowledge of calculus, probability and statistics, optimization, and linear algebra.

Required Course Materials

There is no required textbook for this course. The course will be taught using instructor's class notes, journal papers, other documents, and some references. All *required* reading material will be placed on the course website (Canvas) as class handouts, or available online through the library.

Grading Policy:

Will include: (i) 5 individual homework assignments (50% of final grade; 10% each); (ii) 2 course exams (30% of final grade; 15% each); (iii) assessment on emerging methods for network problems (15% of final grade), and (iv) class attendance (5% of final grade).

The letter grade for the course will be based on the following grading scheme:

- A: 90% and above
- B: 80% to below 90%
- C: 70% to below 80%
- D: 60% to below 70%
- F: Below 60%

Based on the performance of the class, the grading scheme may be adjusted to increase students' grades at the discretion of the instructor.

Description of Graded Components

Individual homework assignments and the assessment should be submitted on Canvas by the due date and time. The exams are closed notes/book and will be administered in class.

Course Policies

Attendance and/or Participation

Each lecture contributes equally towards class attendance. Students are expected to arrive on time for each lecture. Late arrivals disrupt the learning environment. Arriving more than five minutes late will be considered tardy and will not count towards attendance for that lecture; this will be documented using a lecture signup sheet which will be available for the first five minutes of the lecture. A lecture absence may be excused for medical or other extenuating/valid circumstances. In such a case, to the extent possible, a student is

expected to notify the instructor and the TAs in advance of the lecture via email and provide supporting documentation as appropriate.

Collaboration

Each lecture contributes equally towards class attendance. Students are expected to arrive on time for each lecture. Late arrivals disrupt the learning environment. Arriving more than five minutes late will be considered tardy and will not count towards attendance for that lecture; this will be documented using a lecture signup sheet which will be available for the first five minutes of the lecture. A lecture absence may be excused for medical or other extenuating/valid circumstances. In such a case, to the extent possible, a student is expected to notify the instructor and the TAs in advance of the lecture via email and provide supporting documentation as appropriate.

Use of Generative AI

In this course, the use of generative AI tools (such as ChatGPT, Gemini, Copilot, Claude, Meta AI, Qwen Chat, or DeepSeek) is considered a form of collaboration and is not permitted for any of the homework assignments or the assessment. Submitting work that incorporates AI-generated content will be treated as academic misconduct.

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.

Any student suspected of cheating or plagiarism 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.

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 (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.

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 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.