CEE 8813 Syllabus

Freight Transportation Modeling, CEE 8813 M, 3 Credits

Fall 2026

Instructor Information

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General Course Information

Description

Modeling tools for planning, forecasting, and evaluating freight transportation systems.

This course explores tools and techniques to model freight transportation systems from a freight systems planning perspective, forecasting freight movements, and evaluating performance. We will examine the complexities of freight systems, exploring the multi-layered structure of freight networks. We will emphasize the influence of economic factors, data availability, supply chain and logistics decision-making, and public policy and urban planning. We will cover aggregate and disaggregate freight generation, distribution, and mode choice modeling approaches using econometric and optimization techniques. Through a combination of theoretical foundations and case studies, you will learn how to analyze and model freight systems to address modern transportation challenges.

Course Learning Outcomes

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

- Explain the structure, operations, and decision-making processes of freight transportation systems.
- Utilize freight data effectively, address data limitations, and select appropriate modeling approaches.
- Apply advanced modeling techniques to analyze and forecast freight demand generation and distribution.
- Analyze freight transportation systems performance, incorporating logistical, economic, and policy considerations.
- Communicate technical analyses and policy recommendations effectively on real-world freight transportation challenges.

Required Course Materials

A list of relevant resources to be used during the course will be shared in class. Additional reading materials will be provided through Canvas. You are responsible for staying up to date by checking Canvas regularly.

Grading Policy

The following table lists a summary of the graded components of the class.

Component	Weight	Description
Assignments	60%	You will complete approximately 4 assignments. Late submissions will receive 10-point deductions a day up to a total of 50 points unless prior permission (at least 1 day in advance) is received. Collaboration is encouraged to develop a deeper understanding of the material; however, all assignments' results and conclusions must be your own work. All collaboration must be noted at the top of the assignment.
Exams	40%	You will complete 2 exams. Missed exams cannot be retaken.

Grading Scale

Your final grade will be assigned as a letter grade according to the following scale (more information here):

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	0-59%

Description of Graded Components

Additional information about each assignment and project will be provided later in the semester.

Course Policies

Attendance and/or Participation

In this class, you will be asked to discuss concepts, theories, and methods with your peers. Class discussions will help you better understand course content, allow you to ask clarifying questions, and explain concepts and ideas in your own words. To make those discussions most effective:

- You are expected to come to class prepared to raise questions for discussion and to ask for clarification or more examples.
- You are expected to listen actively. You may be asked to paraphrase, summarize, or respond to what others have said. Active listening involves taking notes, asking questions, making eye contact, and listening to others without interrupting them.
- In the event of any disagreements, you are expected to do so respectfully. If you disagree with your peers, keep your discussion focused on the facts and the bigger question rather than on personal feelings.

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.

Plagiarizing is defined by Webster as "to steal and pass off (the ideas or words of another) as one's own: use (another's production) without crediting the source." Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, which will investigate the incident and determine the appropriate penalty.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodations, contact the Office of Disability Services (404-894-2563) as soon as possible to schedule an appointment to discuss your needs and obtain an accommodations letter. Please also email me as soon as possible to schedule 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, acknowledgment, and responsibility between faculty members and the student body. The Student-Faculty Expectations outline basic expectations 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 Georgia Tech's ideals in this class.

Pre- &/or Co-Requisites

College-level calculus and statistics are required. Having previously taken an introduction to transportation course (e.g., CEE 4600 Transportation Planning and Design) is recommended. Previous exposure to optimization concepts (e.g., ISYE 3133 Engineering Optimization) and regression analysis (e.g., CEE 3770 Statistics and Applications or CEE 6601 Linear Statistical Models in Transportation) should be helpful in this course, but it is not a prerequisite.

Collaboration, Group Work, and References

Exams are individual, and no collaboration is allowed. Collaboration in assignments is encouraged to develop a deeper understanding of the material; however, all assignments' results and conclusions must be your own work. All collaborations must be noted at the top of the assignment. You are required to cite all sources you use in any deliverable. This includes direct quotations and cases where you use someone else's ideas, figures, photos, tables, etc. "Sources" include papers, journals, books, conversations, and anything found on the internet. You should provide a source if the thought did not originate with you. See below for more detailed information regarding using artificial intelligence (AI) and how to reference it as your source.

Extensions, Late Assignments, and Re-Scheduled/Missed Examinations

To avoid dealing with lateness and missed examinations, I provide you with more assessment opportunities than you need for your grade. Prior permission must be obtained for late submissions. Permissions will be given only for documented reasons of illness, family emergency, participation in approved Institute activities (such as field trips and athletic events), and accommodations for religious observances. Permissions must be requested via email as soon as you know they are required, and at least one day before the due date for which the permission is requested. Late submissions lose points unless prior permission is obtained. Missed quizzes cannot be retaken.

Re-grading

Requests for regrading may be submitted in writing within one week of the day the grade is returned to the class (regardless of whether you attend that day). You must justify in writing the technical basis for the regrade. If the regrading request is accepted, your entire graded component may be regraded (your grade may decrease afterward). Please do not assume that your grade will always go up after regrading.

Inclement Weather and Digital Learning Days

If a weather-related event affects campus operations, instructors may cancel class or pivot to digital instruction. Informed by departmental and/or program considerations, you may choose to include language here that proactively instructs students what they should expect in such an event. Read more about the policy regarding the requirements, procedures, and responsibilities related to Digital Learning Days for Modified Campus Operations. Explore the Digital Learning Day Toolkit to learn more about guidance and tools that will make pivoting to digital learning easier.

Recording Classroom Activities

To preserve class integrity, student privacy, and a safe environment to express opinions, recording of our classes using digital, tape, or audio devices is not allowed. You are welcome (and even encouraged) to take notes and photos of the board. This policy can be waived at the instructor's discretion and for students with accommodations upon explicit recommendation from the Office of Disability Services.

Student Use of Mobile Devices in the Classroom

Research shows that unexpected noises and movements can divert and capture people's attention, disrupting the learning experience for everyone in the class. Therefore, it is essential to ensure that your devices, such as cell phones, pagers, or laptops, do not create any noise or visual distractions. However, to make learning more engaging, we may occasionally use digital resources during class. To make the most of these resources, you are encouraged to bring a charged, web-enabled device to class so you can take notes and access course materials. To avoid any distractions, it is recommended to turn off the sound on your device. If you use your device for anything other than taking notes or accessing course materials, please sit in the back row so as not to distract other students.

Student Use of Artificial Intelligence

You may use generative AI programs, e.g., ChatGPT, to help generate ideas and brainstorm. You should be aware that the material generated by these programs may be inaccurate, incomplete, biased, or otherwise problematic. Also, using these tools may stifle your independent thinking and creativity. Generative AI derives its output from previously created texts from other sources that the models were trained on, yet does not cite sources. Per Georgia Tech's Honor Code, you may not submit any work generated by an AI program as your own. If you include material generated by an AI program, it should be cited like any other reference material (with due consideration for the quality of the reference, which may be poor). When/if you use AI platforms in your assignments, please write a note to clarify where in your process you used AI, including the prompt used to generate the material and which platform(s) you used. See this article for how to cite AI.

Campus Resources for Students

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.

Statement of Intent

By enrolling in this course, you are acknowledging your acceptance of the syllabus and agreeing to follow the guidelines provided. Any necessary changes to the syllabus will be communicated to you.