ISYE 3133 Engineering Optimization - Spring 2027

Instructor information

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Course information

Course description This course introduces optimization methods used to solve decision-making problems that arise in industrial engineering, operations research, and other fields of engineering, business and management.

Prerequisites Math 2602 or 2603 (C or better), CS 2316 or CS 1322, ISyE 2027, or equivalent.

Course Outcomes At the end of this course, students will be able to:

1. Formulate deterministic mathematical programs in various practical systems
2. Understand basic optimization techniques
3. Be able to interpret the results of a model and present the insights (sensitivity, duality)
4. Know the limitations of different solution methodology
5. Use software to solve problems

Required Course Materials

Students are required to download a personal Gurobi license for use with the Vocareum environment in Canvas. The following textbook is recommended, but not required.
Winston and Venkataramanan, Introduction to Mathematical Programming (ISBN-10: 0534359647 / ISBN-13: 978-0534359645)

Grading Policy

The weights used for grade assignment will be

Assignment type	Weight
Programming assignments:	15% (3-4 assignments)
Attendance/Participation:	10% (5% Lecture, 5% Studio)
Quizzes	15% (5-8 quizzes)
Midterm exams	30% (2 midterms at 15% each)
Final exam	30%

Thresholds for letter grade assignment are as follows.

Letter grade	Percentage range
A:	89.5% ≤ total grade ≤ 100%
B:	79.5%≤ total grade <89.5%
C	69.5%≤ total grade <79.5%
D	59.5%≤ total grade <69.5%
F	0%≤ total grade <59.5%

Programming assignment There will be three to four programming assignments.

Participation/Attendance In-person attendance is required for both lecture and studio. Lecture participation points come from in-person attendance. Studio participation points come from completion of studio worksheets, as well as a few take-home assignments. Participation is evaluated on effort, not correctness, except in some cases with unlimited submission attempts, where questions will be evaluated for correctness. The lowest two grades in lecture participation and the lowest two grades in studio participation will be dropped.

Quizzes Five to eight quizzes will be given during the semester. Quizzes must be taken in a student's assigned studio section. Quizzes are graded for correctness, with partial credit awarded for partial answers (e.g. work shown) or to account for minor errors.

Midterm and final exams Two midterm exams and one final exam will be given during the semester. Exams are graded for correctness, with partial credit awarded for partial answers (e.g. work shown) or to account for minor errors.

Course policies

Attendance In-person attendance is required.

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.

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.

Collaboration, Group Work, and Use of Generative AI You are allowed to talk to other students in class about the programming assignments, but any work you turn in must be written yourself. Quizzes and exams are to be your own work. All quizzes and exams will be closed book and notes.

Generative AI In general, use of Generative AI and of any previous semester course materials, such as homework, projects, and any other coursework, are prohibited in this course. Using these materials will be considered a direct violation of academic policy and will be dealt with in accordance with the GT Academic Honor Code. **When in doubt regarding what constitutes a violation, do not guess the answer and post on Piazza for clarifications**.

Extensions, late assignments, and re-scheduled/missed exams Studio participation can be turned in within 24 hours of a missed studio for half credit. If the absence is excused, it can be turned in within 24 hours of a missed studio for full credit. Turning in the programming assignments late will lead to a deduction in points. Makeup quizzes are only offered for institute-approved reasons. No makeup exams are offered. If an exam is missed for an institute-approved reason, the weight of the exam will be shifted to the final. Contact the instructor within the first two weeks of the semester if dates of quizzes/exams conflict with an institute-approved absence or religious observance.