ISYE 4515 Intelligent Healthcare Delivery Systems | CRN 35344 | 3 Credit Hours

Spring 2027
Monday and Wednesday, 3:30 PM to 4:45 PM
Scheller Tower, Room 247, Georgia Tech-Atlanta Campus

Instructor Information

Instructor: Dima Nazzal
Email: dima.nazzal@gatech.edu
Instructor: Lauren Steimle
Email: steimle@gatech.edu

General Course Information

DRAFT

Description

Healthcare systems involve patients, providers, insurers, and regulators pursuing objectives that often conflict, including quality, access, and efficiency. This course treats healthcare delivery as a system to be analyzed and improved. Students learn to represent a delivery setting in terms of its flows, resources, and decisions, to measure how it performs, and to apply industrial and systems engineering methods to decisions at operational, tactical, and strategic time scales. Topics include process analysis and mapping, performance measurement, capacity and patient flow, resource allocation and scheduling, and facility and network decisions. Instruction combines lectures, case discussions, and a term project.

Prerequisites

One of: ISYE 3030, ISYE/CEE 3770, ECE 3077, ECON 2250, PUBP 3120, or BMED 2400; and MATH 2551 or MATH 2550.

Students should be comfortable with quantitative methods and basic data analysis.

Course Learning Outcomes

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

- Identify the needs, requirements, and limitations of a healthcare system, including the stakeholders in a delivery setting and how their objectives conflict.
- Evaluate healthcare systems and performance indicators.

- Perform basic health data analytics.
- Model and improve healthcare system performance, including analyzing capacity and flow problems, evaluating an intervention's effects on cost, capacity, and workload, and assessing a data-driven decision support tool as an operational intervention.

Required Course Materials

There is no required textbook. Readings, case materials, and data sets will be posted on Canvas. Recommended readings will be identified throughout the semester.

Grading Policy:

Final grades are determined by the weighted components listed below. Letter grades are assigned as follows: A, 90 to 100; B, 80 to 89; C, 70 to 79; D, 60 to 69; F, below 60. Georgia Tech awards final course grades on a scale of A through F, with no plus or minus grades.

Assignments

- Semester project: 35%
- Exam: 25%
- Case assignments and discussions: 30%
- Attendance and participation: 10%

DRAFT

Description of Graded Components

Project (35%). Students work in teams on a healthcare delivery problem, moving from problem definition and process analysis through data analysis to a recommended change and the case for it. The project is submitted in stages across the semester and concludes with a written report and a presentation.

Exam (25%). One exam assesses individual command of the course methods and the ability to reason about a delivery setting that has not been discussed in class.

Case assignments and discussions (30%). Cases are assigned weekly or biweekly. Students submit a short written analysis before class and take part in the discussion of the case during class.

Attendance and participation (10%). Attendance is required. Participation is assessed on preparation for and contribution to case discussions and in-class activities.

Course Policies

Attendance and/or Participation

Attendance is required. Course material builds across sessions, and much of the learning happens through case discussion and in-class work that cannot be reproduced from slides. Students are responsible for all announcements, assignments, and material covered in class. Attendance and participation together account for 10% of the course grade.

For information about excused absences, see the Institute expectations and restrictions related to attendance.

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.

DRAFT

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.

Campus Resources for Students

Undergraduate Student Academic Success Resources:

- Academic Support: Academic Success and Advising (a unit in the Office of Undergraduate Education & Student Success) provides free support for your courses. Students can attend scheduled supplemental review (PLUS) sessions, stop by Drop-In Tutoring, or schedule a one-on-one appointment through Knack. To explore what options work best for you, please visit us online at success.gatech.edu/tutoring, email us at tutoring@gatech.edu, or come see us at Clough Undergraduate Learning Commons, Suite 283.

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)

DRAFT