# [ISyE 3044] Syllabus

[Simulation Analysis and Design, Section A, and 3 Credits]

[Fall 2026]

## Instructor Information

**Instructor: Eunhye Song, Associate Professor**

**Email: Eunhye.song@isye.gatech.edu**

## General Course Information

### Description

Discrete event simulation methodology emphasizing the statistical basis for simulation modeling and analysis. Overview of computer languages and simulation design applied to various industrial situations.

### Course Learning Outcomes

Upon completing this course, the students will be able to

1. Fit input distributions from data collected from the target system to be simulated
2. Create a simulation model that serves the analysis objectives from the problem description and validate it
3. Statistically analyze the simulated system from the simulation outputs
4. Compare multiple policies/system designs/alternatives based on simulation and draw statistically meaningful conclusions on optimality
5. Draw engineering/business insights from simulation studies to support decision-making under stochasticity

### Required Course Materials

No required textbook.

### Grading Policy:

In-class labs: 10%

Homework: 15%

Quizzes: 40%

Projects: 35%

**Description of Graded Components**

**In-class labs:**

There will be in-class lab sessions demonstrating/implementing what you learned in class. Detailed written instructions will be given and you are required to submit your models and simple reports by the end of the class.

**Homework**:

Some homework will be in the form of a problem set, but often the homework assignments will be related to the in-class labs. You will be asked to modify the models you built during the lab and perform a more in-depth analysis in your homework.

**Quiz**:

There will be three in-class quizzes in total. The dates are TBD. If you cannot take the quiz on the scheduled dates for GT approved reasons, you should inform me at least a week before the exam; otherwise, no accommodation will be made. In case of emergency, you should contact the Dean of Students immediately. With the confirmation from the Dean of Student, we will discuss your options.

The latter two quiz material will be closely related to what is covered in the two projects (see below). These quizzes are designed to assess individual understanding of the material to complement group projects.

**Projects**:

All projects will be done in a group of three to four students. If you wish to work alone on the projects, you need to ask for an approval from me before the first project assignment.

Very detailed guidelines for the project report will be given. The first project will be on a static simulation problem with Python. The second will be a discrete-event simulation project implemented with Simio.

After submitting the final report for each project, there will be peer reviews of team members in the following categories: 1) responsiveness; and participation in 2) office hours discussions, 3) problem formulation, 4) programming, 5) statistical analysis, and 6) report writing. All members are expected to partake in each of these processes and graded based on the scale: 1 – insufficient, 2 – sufficient, 3 – terrific. If you receive 1 in four or more categories from your teammates, you will receive 50% of the team's grade on the project.

**Grade breakdown**

**A:** Total grade of 90 or above

**B:** 80 or above

**C:** 70 or above

**D:** 65 or above

## Course Policies

### Attendance and/or Participation

Although the attendance will not be actively checked regularly, the basic assumption is that all students will attend all classes. I strongly encourage taking notes during the class to perform well in class.

### 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

Core IMPACTS is the University System of Georgia's General Education curriculum. If you are teaching a course that counts towards Core IMPACTS, you should include a syllabus statement about the Core area and associated career competencies. This resource developed by the Center for Excellence in Teaching and Learning and Online Education at Georgia State University includes template syllabus statements for each of the Core IMPACTS areas that you may adapt for your course.

### 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.

**Pre-Requisites**

ISYE2027 (Probability with Applications), ISYE2028 (Basic Statistical Models) and ISYE3232 (Stochastic Manufacturing and Service Systems)

**Extensions, Late Assignments, & Re-Scheduled/Missed Exams**

**Late Homework/Project Submission**:

The submission due will be strictly enforced. Canvas will record your submission time and the following late penalty will be applied: up to 24 hours from the due date, you will receive a linearly increasing penalty calculated as follows.

*(submission time – due date)/24 hours * 50 %*

For instance, if your submission was made 6 hours after the due date and you got 90/100 for the homework, you will receive 12.5% penalty. That is, you will receive 87.5% x 90 = 78.75 as your homework grade. After 24 hours, the solution key will be posted on Canvas and *no credit will be given for later submissions*.

**Regrade Request of Assignments**:

If you feel that an error has been made in grading your assignment, you may request a regrade. All regrade requests should be communicated to me by email outlining the potential error **within one week of it being returned. This timetable will be strictly adhered to.** The TAs are **not** going to accept the regrade request.

**Lectures/Labs**

- **Lecture notes:** The lecture notes (with many blanks) will be posted on Canvas at least 24 hours before each lecture (if not, that means I have accidentally forgotten, so please poke me!). I will use a slide deck in class and fill out the blanks as we proceed. If you prefer taking notes on your own, you can (i) print posted lecture notes or download them to your note-taking device and (ii) take notes and fill out blanks in class. This is recommended.
  However, if you prefer to focus on lecture contents without worrying about note-taking, I will post my version on Canvas after each class.
- **Programming:** We will do a lot of programming in class. Thus, *everyone must bring a laptop when there is a lab*.

**Software**

In the first half of the course, we will use Python, then we will switch to using Simio.

- **Simio installation**

Simio is a comprehensive discrete-event simulation package with extensive modeling, animation, and statistical analysis capabilities. Simio runs on the Microsoft Windows OS. You will need to save Simio models you built during classes because we will often continue from the previous models and revise them in later lectures. Also, you will be asked to submit models you created in class.

Simio's academic edition is available in the ISyE computer labs. Simio is available on mycloud.gatech.edu on the ISYE-SIMIO virtual desktop or as an app. Keep in mind that the total number of concurrent users is limited to 250. Since virtual applications depend on network connections and often experience technical issues, *I strongly recommend that you download your own copy on your laptop. Simio student version is now offered for free and can be downloaded here, if you are a Windows user:*
Complete and submit this form to request your Student License using the email address that was provided to you by your university. Once your form request is approved, you will receive an email including your license and instructions on how to activate your license. Important information on licenses, version compatibility, and troubleshooting can be found in the *More Resources* section of our Academic Licensing page.

If you are a Mac user, sorry, but Simio doesn't run on Mac OS. You can still access Simio via mycloud.gatech.edu

- Additional Simio resources:
  - The introductory e-book Rapid Simulation Solutions: Introduction to Simulation and Simio is available from the Books menu in the Support ribbon of Simio.