ISyE 3044 Simulation Analysis and Design – Spring 2027 (virtual session)

Instructor information

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Teaching assistant

TBD

Course information

General knowledge of modeling and analysis of discrete event simulation. Overview of computer languages and practical introduction to the Simio software.

Prerequisites

- Knowledge of probability and statistics at the level of ISyE 2027/2028. Random variate generation and analysis of simulation input and output require a variety of statistical tools.
- Stochastic processes and queueing theory at the level of ISyE 3232. The required concepts will be reviewed in an accelerated fashion.

Course Outcomes

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

- Generate samples from common distributions and stochastic processes;
- Build discrete event simulation models of various systems;
- Model input distributions with or without data;
- Design simulation experiments, analyze and interpret simulation outputs;
- Verify and validate simulation models;
- Compare and optimize systems based on simulation models;
- Quantify and interpret input model risks;
- Implement the methodologies above with the Simio software.

Course Materials

Required textbook Simio and Simulation: Modeling, Analysis, Applications, 7th Edition, J.S. Smith and D.T. Sturrock, 2025. Online book is available at https://textbook.simio.com/SASMAA7/.

Supplemental book Discrete-Event System Simulation, 5th Edition, J. Banks, J.S. Carson, B.L. Nelson, D.M. Nicol, Prentice Hall, New York, 2010.

Required software There are two options to access Simio:

1. Simio is available on https://mycloud.gatech.edu both on the virtual desktop and as an app. To use the latter, click on Apps and then click on the plus (+) sign on the left-hand side. Then click on ISyE Apps, and choose Simio as an add-on app. Virtual applications depend on network connections and some objects may not display properly.
2. Install Simio on your own computer. Simio is giving away a FREE academic license for students to use for one year on their personal devices. Your Student License Claim Code will be give at the beginning of the semester.

Simio runs on reasonably new computers running the Microsoft Windows operation system. If you are using Mac, please refer to the following link for more installation instructions: https://cdn.simio.com/SimioLicenses/MacInstructions.pdf

Grading Policy

The weights used for grade assignment will be:

Assignment type	Weight
Class attendance	5%
Homework assignments	10%
Quizzes	45% (3 quizzes at 15% each)
Midterm project	20%
Final project	20%

Thresholds for letter grade assignment are as follows.

Letter grade	Percentage range
A:	90% ≤ total grade ≤ 100%
B:	80%≤ total grade <90%
C:	70%≤ total grade <80%
D:	60%≤ total grade <70%
F:	0%≤ total grade <60%

Homework Homework assignments will be graded on a 0-2 scale: 0 for missing or incomplete assignments; 1 for almost or fully completed assignments with nontrivial mistakes; 2 for fully completed assignments with minimal or no mistakes. Homework assignments and their solutions will be posted at the same time on Canvas. I strongly suggest you try to complete the assignments on your own and only refer to the solutions when you have tried everything else. If you do check the solutions, focus only on the step where you're stuck, then continue working on the rest by yourself.

Quizzes Each quiz counts for 15%. Quizzes will be posted on Canvas at 8am on the assigned day. You can choose any 1.5-hour window before 11:59pm on the same day to complete the quiz on Canvas. In order to take the quiz on Canvas, you need to have a camera installed on your computer, and turn on your camera with your face and upper body in the camera during the entire duration of the quiz. You must complete the quiz independently on your own.

Projects Each project counts for 20%. The project description will be posted on Canvas at 8am on the assigned day. You can choose any 2-hour window on the same day to complete the project. You should submit the following on Canvas by 11pm the same day: 1) your project report; 2) Simio files and any other files specified in the project description. You must complete the project independently on your own.

Regrading If TA or I have made a mistake in grading a quiz/project, we will be happy to correct it. If a quiz/project is submitted for regrading, we will regrade the entire thing, so it is possible for you to lose additional points. All requests for regrading must be submitted in writing within 48 hours from when the grade is first returned to you.

Course policies

Attendance Attending and participating in lectures is crucial for effective learning. If you cannot attend a lecture, please email me with appropriate documentation before class starts. Attendance will be taken randomly throughout the semester, and it will contribute to 5% of your final grade. Absences with prior notification (e.g. sending an email before the start of the class) and valid documentation (e.g., doctor's notes) will be considered as attendance.

Class discussion We will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and the instructor. Rather than emailing questions to the TA or the instructor, please post your questions to Piazza on Canvas. The TA and I will check Piazza periodically and answer questions. You are also encouraged to answer these questions and participate in discussions as much as you can. The top two students who submit the greatest number of good answers will receive an extra credit of 3 points towards their class grades.

Academic Integrity All quizzes and projects should be completed independently; you are not allowed to discuss them with anyone else. You can work together on homework problems, but you should write down your own solutions.

Generative AI You are permitted to use AI tools for your assignments and projects. However, you must not use AI for your quizzes. If you use any AI tools, your submitted work must include a brief AI Usage Statement outlining:

- Which tools were used
- When they were used
- What prompts or questions were given
- How the AI output informed or shaped your final submission

You are expected to critically engage with any AI-generated content and ensure your final work reflects your own understanding and academic voice. Generative AI should never be used to fabricate data, cite non-existent sources, or bypass learning objectives. Use of Generative AI must comply with Georgia Tech's Honor Code and academic integrity guidelines.

Extensions, late assignments, and rescheduled or missed assessments All assignments and lab files must be submitted electronically to Canvas on time. It is your responsibility to submit the correct and complete set of files to Canvas. NO late submission will be accepted.

Rescheduling/Missing quiz or project: I understand things happen in life! Everyone has one opportunity throughout the semester to reschedule a quiz or project, provided that you notify me with valid documentation at least one week in advance. Your rescheduled time must be before the original time of the quiz/project, and the rescheduled quiz/project may be different (and often harder). If you need to reschedule more than once, only the first will be accommodated; subsequent missed quiz(es)/project(s) will have their grade weight redistributed to the remaining assessments. In cases that you are not able to request rescheduling one week in advance, missed quizzes/projects will also have their weight redistributed to others.

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.