MATH 448: Stochastic Simulation
Fall 2022 Course Syllabus

NJIT Academic Integrity Code: All Students should be aware that the Department of Mathematical Sciences takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor.

COURSE INFORMATION

Course Description: An introduction in the use of computer simulation to study stochastic models. Topics include the generation of samples of continuous and discrete random variables and processes with applications to stochastic models, statistical analysis of the results, and variance reduction techniques.

Number of Credits: 3

Prerequisites: Introductory probability (MATH 244 or MATH 333), numerical methods (MATH 340), and the ability to program a computer in a language such as Fortran or C.

Course-Section and Instructors:

Course-Section	Instructor
Math 448-101	Professor D. Horntrop

Office Hours for All Math Instructors: Fall 2022 Office Hours and Emails

Required Textbook:

Title	*Simulation*
Author	Ross
Edition	5th
Publisher	Academic Press
ISBN #	978-0125980630

University-wide Withdrawal Date: The last day to withdraw with a **M** is **Monday, November 14, 2022**. It will be strictly enforced.

POLICIES

DMS Course Policies: All DMS students must familiarize themselves with, and adhere to, the Department of Mathematical Sciences Course Policies, in addition to official university-wide policies. DMS takes these policies very seriously and enforces them strictly.

Grading Policy: The final grade in this course will be determined as follows:

Homework/ Quizzes/Projects**	30%
Midterm Exam	35%
Final Exam	35%

****I will drop your one lowest homework or quiz score from throughout the semester.**

Attendance Policy: Attendance at all classes will be recorded and is **mandatory**. Please make sure you read and fully understand the Math Department's Attendance Policy. This policy will be strictly enforced. Attendance at and participation in all lectures is expected. If you know in advance that you will be absent from class for a legitimate reason, please tell me prior to your absence so that appropriate arrangements (if any) can be made. Tardiness to class is very disruptive to the classroom environment and should be avoided.

Homework: Homework assignments/projects will be given frequently; many will involve writing computer programs in a computer language such as C or Fortran. Each assignment must be turned in at the beginning of class. Late assignments are NOT accepted. Early assignments are always welcomed and are appropriate for pre planned absences from class. Even though every problem in an assignment may not be graded, you are expected to attempt all of them. As a standing assignment, you should read the relevant sections of the textbook prior to lecture.

Quizzes: From time to time, quizzes may be given. Make up quizzes are NOT given.

Exams: There will be a midterm examination and a final examination. The midterm examination will occur before the "drop" deadline. The final examination date, time, and location will be determined by the university:

Midterm Exam	TBA
Final Exam	December 16 – 22, 2022

The final exam will test your knowledge of all the course material taught in the entire course. Make sure you read and fully understand the Math Department's Examination Policy. This policy will be strictly enforced.

Makeup Exam Policy: There will be **NO MAKE-UP QUIZZES OR EXAMS** during the semester. In the event an exam is not taken under rare circumstances where the student has a legitimate reason for missing the exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor's note, police report, court notice, etc. clearly stating the date AND time of the mitigating problem. The student must also notify the Math Department Office/Instructor that the exam will be missed.

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times.

COURSE TOPICS

Major topics for this course include:

- Review of basic probability, generation of pseudorandom numbers, Monte Carlo integration
- Simulation of random samples from discrete distributions and continuous distributions
- Discrete event simulation for stochastic models of queueing systems and financial problems
- Analysis, verification, and validation of simulation results, variance reduction techniques

ADDITIONAL RESOURCES

Math Tutoring Center: Located in the Central King Building, Lower Level, Rm. G11 (See: Fall 2022 Hours)

Further Assistance: For further questions, students should contact their instructor. All instructors have regular office hours during the week. These office hours are listed on the Math Department's webpage for Instructor Office Hours and Emails.

Accommodation of Disabilities: The Office of Accessibility Resources and Services (OARS) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please contact Scott Janz, Associate Director of Disability Support Services at 973-596-5417 or via email at scott.p.janz@njit.edu. The office is located in Kupfrian Hall, Room 201. A Letter of Accommodation Eligibility from the Office of Accessibility Resources and Services office authorizing your accommodations will be required.

For further information regarding self identification, the submission of medical documentation and additional support services provided please visit the Office of Accessibility Resources and Services (OARS) website.

Important Dates (See: Fall 2022 Academic Calendar, Registrar)

Date	Day	Event
September 5, 2022	Monday	Labor Day
September 6, 2022	Tuesday	First Day of Classes
September 12, 2022	Monday	Last Day to Add/Drop Classes
November 14, 2022	Monday	Last Day to Withdraw
November 22, 2022	Tuesday	Thursday Classes Meet
November 23, 2022	Wednesday	Friday Classes Meet
November 24 to November 25, 2022	Thursday and Friday	Thanksgiving Recess - Closed
November 26, 2022	Saturday	Saturday Classes Meet
December 14, 2022	Wednesday	Last Day of Classes
December 15, 2022	Thursday	Reading Day

December 16 to December 22, 2022	Friday to Thursday	Final Exam Period

Updated by Professor D. Horntrop - 7/19/2022
Department of Mathematical Sciences Course Syllabus, Fall 2022