Fall 2019

MATH 448-001: Stochastic Simulation

D. Horntrop

NJIT New Jersey's Science & Technology University

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF MATHEMATICAL SCIENCES

MATH 448: Stochastic Simulation
Fall 2019 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. The NJIT Academic Integrity Code applies to all activities associated with this course, including but not limited to homework, quizzes, examinations, and projects. As an example, when you submit a homework assignment, you are certifying that your paper contains only your work and is not copied from other people or sources.

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 2019 Office Hours and Emails

Textbook:

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

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, November 11, 2019**. 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.

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 of the classroom environment and should be avoided.

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

The midterm examination will represent 35% of your grade. The final examination will also be worth 35% of your grade. The remaining 30% of your grade will be determined by your homework/quizzes/projects; in calculating this quantity, I will drop your one lowest homework or quiz score from throughout the semester.

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 preplanned 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 14 - 20, 2019

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 2019 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.

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

Accommodation of Disabilities: Disability Support Services (DSS) 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 Chantonette Lyles, Associate Director of Disability Support Services at 973-596-5417 or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. A Letter of Accommodation Eligibility from the Disability Support 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 Disability Support Services (DSS) website at:

- https://www.njit.edu/studentsuccess/accessibility/

Important Dates (See: Fall 2019 Academic Calendar, Registrar)

Date	Day	Event
September 3, 2019	T	First Day of Classes
September 13, 2019	F	Last Day to Add/Drop Classes
November 11, 2019	M	Last Day to Withdraw
November 26, 2019	T	Thursday Classes Meet
November 27, 2019	W	Friday Classes Meet
November 28-29, 2019	R-F	Thanksgiving Recess
December 11, 2019	W	Last Day of Classes
December 12, 13 2019	R & F	Reading Days
December 14-20, 2019	F – R	Final Exam Period