This is a short course (January 18th to March 11th) which quickly introduces the basics of stochastic simulation. Roughly, we will go through as much of Asmussen and Glynn's book on Stochastic Simulation as is comfortable. Our goal is to understand algorithms and some simplified results on speed of convergence. Our intended audience is not only mathematicians, but students from engineering, physics, and finance. We assume that the students will either be willing to accept, ex cathedra, basic aspects of measure theory, or have the ability to understand them on their own.

Sample Topics to be Covered (Provisionally)
- Stochastic Differential Equations
- Gillespie Algorithm
- Monte Carlo Methods (including Markov Chain Monte Carlo)
- Levy processes
- Importance Sampling

Project: You will be required to actually code up an algorithm. The coding will be done in groups. The algorithm must be coded in C++ and a graphical display must be coded in Mathematica, Matlab, or R.

Grading: Grades will be determined on the basis of homework (20%), a midterm (20%), the project (20%) and a final (40%).


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