Instructor
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Course web page: http://www.math.wsu.edu/math/faculty/lih/516.html
Office hours: Tu, Th 10:25 – 12:00pm, and by appointment.

Teaching assistant
Yan Xing, Neill 411, yanz.xing@email.wsu.edu
Office hour: Mon, 11:00-12:00am

Textbook/material

Week-to-week course outline

- Review of probability (week 1)
- Brownian motion (week 2)
- Financial asset pricing and Black-Scholes model (week 3)
- Basic scheme of Monte Carlo simulation and error estimates (week 4)
- Generating random variables (week 5)
- Sampling multivariate normal and scale mixture distributions (week 6)
- Variance reduction 1: Antithetic sampling and control variates (week 8)
- Variance reduction 2: Stratified sampling (week 9)
- Fundamentals of importance sampling (week 10)
- The cross-entropy method and application to risk analysis (week 11)
- Stochastic integrals and Itô’s lemmas (week 12)
- Simulation of Itô’s diffusion (week 13)
- Sensitivity analysis (week 14)
- Project (option pricing, week 15)

Learning outcomes
Students will be able to (1) have a broader view on the basic methods for stochastic simulation; (2) acquire state-of-the-art quantitative techniques for simulating Brownian motion and Itô’s diffusion, two stochastic processes widely used in science and engineering; (3) use MATLAB to get hands-on simulation experience.

Exams & assignments (credit %)
• Homework assignments: approx. 7, assigned and collected in class (30%).
• Project (5%)
• Mid-Term Exam: tentatively scheduled for October 3, in class (30%).
• Final Exam: December 12, in class (35%).

Grading scale: A (94–100), A– (90–93), B+ (88–89), B (84–87), B– (80–83),
C+ (78–79), C (74–77), C– (70–73), D+ (68–69), D (60–67), F (≤ 59).

Policies

• Homework is to be turned in at the beginning of class on the designated due date.
  *No late homework is accepted.* Solution keys (for assignments & exams) will be posted on the
  web page.
• No compensation for missed exams will be considered unless prior approved arrangements have
  been made.

Academic Integrity
Academic integrity will be strongly enforced in this course. Any student caught cheating on any
assignment will be given an F grade for the course and will be reported to the Office Student
Standards and Accountability. Cheating is defined in the Standards for Student Conduct WAC
504-26-010 (3). It is strongly suggested that you read and understand these definitions.

WSU Disability Statement
Reasonable accommodations are available for students with a documented disability. If you have
a disability and need accommodations to fully participate in this class, please either visit or call
the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with
an Access Advisor. All accommodations MUST be approved through the Access Center. For
more information contact a Disability Specialist at Access.Center@wsu.edu or visit the webpage:
http://accesscenter.wsu.edu

WSU Safety
Washington State University is committed to enhancing the safety of the students, faculty, staff, and
visitors. It is highly recommended that you review the Campus Safety Plan (http://safetyplan.wsu.edu/)
and visit the Office of Emergency Management web site (http://oem.wsu.edu/) for a comprehen-
sive listing of university policies, procedures, statistics, and information related to campus safety,
emergency management, and the health and welfare of the campus community.