

MATH 7244 SYLLABUS
SPRING 2007

- Course Number:** Math 7244
- Course Title:** Stochastic Processes and Stochastic Calculus I
- Lecture Time:** TTh 9:35–10:55am
- Lecture Room:** Skiles 271
- Instructor:** Dr. Yuri Bakhtin
Office: Skiles 167
Office Phone: 404-894-9235
Email: *bakhtin@math.gatech.edu*
Office hours: Wednesday 10–11 or by appointment
- Course Web Page:** *<http://www.math.gatech.edu/~bakhtin>*
- Contacting me:** The best way to contact me is by email.
- Prerequisite:** Math 6242 (Probability II)
- Brief Description:** An introduction to continuous-time martingales, Markov processes and Itô's stochastic calculus.
- Book:** Our main text will be [KS]: *I. Karatzas, S.E. Shreve: Brownian Motion and Stochastic Calculus, 2nd edition.*
- Material from [KS] that will be covered:**
- CHAPTER 1: The notion of stochastic process. Filtrations, martingales and related notions.
 - CHAPTER 2: Measures on functional spaces. The consistency theorem. Weak convergence of stochastic processes. Wiener measure. Invariance principle. The Markov property. Properties of Brownian paths.
 - CHAPTER 3: Stochastic integral and its properties. Itô's formula. The martingale characterization of the Wiener process.

Honor code: All students are expected to comply with the Georgia Tech Honor Code. Any violations of the Georgia Tech Honor Code will be submitted directly to the Dean of Students. The Georgia Tech Honor Code is available at

http://www.deanofstudents.gatech.edu/integrity/policies/honor_code.php

Grading: There will be 4 homework assignments (each one is worth 10%, the lowest score will be dropped, which amounts to total of 30%), one in-class mid-term exam (worth 30%), and one comprehensive final exam (worth 40% of the final score). Letter grades will be based on the accumulated points according to the standard 90%, 80%, 70%, 60% cutoffs: A: 90–100, B: 80–89, C: 70–79, D: 60–69, F: 0–59.

At the end of the course I shall evaluate the class distribution and decide if a curve is needed which may result only in lowering the above cutoffs.

Homework: Homework assignments will be given approximately once every three or four weeks, and will usually be due one week after they are handed out. All homework assignments will appear online at the URL given above. Since [KS] contains a lot of problems with answers, a substantial fraction of the homework problems will not be graded. So, each assignment will contain two lists of problems:

A. Problems to be graded (selected from the book or made up by myself). B. Other problems from the book that will not be graded.

It is strongly recommended to solve problems from list B before reading the solutions given in the book.

You are allowed to work together with other students on the homework as long as you each independently write up your own solution. You are encouraged to ask me questions.

Please staple the homework and print your name on the front page of each assignment you submit. All homework is due by 5pm on the due date or it will be considered to be late and will not be accepted.

Exams: At the exams you will have to demonstrate your knowledge of the course material as well as your ability to solve problems based on it. Most problems on the exams will be similar to those discussed in class or assigned as homework (both lists, A and B). The tentative dates for the exams are:

Mid-term Exam: Tue Feb 27 (in class, 75 minutes).

Final Exam: Thu May 3 (8:00 – 10:50).

All exams are closed-book and no aids will be allowed. Makeup exams are given only in extraordinary circumstances.

Some other special dates: There will be no class on Tue March 20, Thu March 22 due to the Spring Break. Fri March 2 is the Drop Day.