NYU Stern School of Business
Undergraduate College

STAT-GB.3321.20 (C22.0021): STOCHASTIC PROCESSES I

Fall 2013

Instructor Details

Frydman, Halina

Email: hfrydman@stern.nyu.edu

Phone: 212-998-0453

Office Hours: Wed 4:45 – 5:45pm

Office Location: KMC 8-55

Course Meetings

Meeting time(s): W, 6:00pm to 9:00pm

Location: Tisch T-UC24

Final Exam:

Schedule exceptions
   Class will not meet on:
   Class will meet on:
Course Description and Learning Goals

The purpose of the course is to introduce students to the classes of stochastic processes, which are widely used as modeling tools in business fields such as finance, marketing and actuarial science as well as in physical and social sciences.

Course Pre-Requisites

C22.0014 - Introduction to the Theory of Probability

Course Outline

This is an introductory course in stochastic processes. The course covers basic theory of discrete and continuous time Markov chains, of Brownian motion and its generalizations, and of martingales. The discussion of Markov chains and Brownian motion includes statistical aspects of these processes. If time permits, the idea of stochastic integration is introduced and the rules of stochastic calculus are developed. The topics are covered in the following order:

1. Discrete-time Markov chains.
2. Continuous-time Markov chains.
3. Discrete-time martingales.
5. Elements of stochastic calculus (if time permits).

Required Course Materials

Texts

- Lecture Notes

The following additional texts are useful references to the topics covered in the course. In particular the third and the fifth topics of the course will use the material from Lawler. The remaining references are sources of many additional interesting examples of Markov processes studied in the course.
Additional references


Assessment Components

TBA

Grading

At NYU Stern we seek to teach challenging courses that allow students to demonstrate their mastery of the subject matter. In general, students in undergraduate core courses can expect a grading distribution where:

- 25-35% of students can expect to receive A’s for excellent work
- 50-70% of students can expect to receive B’s for good or very good work
- 5-15% of students can expect to receive C’s or less for adequate or below work

Note that while the School uses these ranges as a guide, the actual distribution for this course and your own grade will depend upon how well you actually perform in this course.

Re-Grading

The process of assigning grades is intended to be one of unbiased evaluation. Students are encouraged to respect the integrity and authority of the professor’s grading system and are discouraged from pursuing arbitrary challenges to it.

If you believe an inadvertent error has been made in the grading of an individual assignment or in assessing an overall course grade, a request to have the grade re-evaluated may be submitted.
You must submit such requests in writing to me within 7 days of receiving the grade, including a brief written statement of why you believe that an error in grading has been made.

**Professional Responsibilities For This Course**

**Attendance**

- Class attendance is essential to your success in this course and is part of your grade. An excused absence can only be granted in cases of serious illness, grave family emergencies, or religious observance and must be documented. Job interviews and incompatible travel plans are considered unexcused absences. Where possible, please notify me in advance of an excused absence.

**Participation**

In-class contribution is a significant part of your grade and an important part of our shared learning experience. Your active participation helps me to evaluate your overall performance. You can excel in this area if you come to class on time and contribute to the course by:

- Providing strong evidence of having thought through the material.
- Advancing the discussion by contributing insightful comments and questions.
- Listening attentively in class.
- Demonstrating interest in your peers' comments, questions, and presentations.
- Giving constructive feedback to your peers when appropriate.

**Assignments**

- Late assignments will either not be accepted or will incur a grade penalty unless due to documented serious illness or family emergency. Exceptions to this policy for reasons of religious observance or civic obligation will only be made available when the assignment cannot reasonably be completed prior to the due date and you make arrangements for late submission in advance.

**Classroom Norms**

- Arrive to class on time and stay to the end of the class period. Chronically arriving late or leaving class early is unprofessional and disruptive to the entire class. Repeated tardiness will have an impact on your grade.
• Turn off all electronic devices prior to the start of class. Laptops, cell phones and other electronic devices are a distraction to everyone.

Stern Policies

General Behavior
The School expects that students will conduct themselves with respect and professionalism toward faculty, students, and others present in class and will follow the rules laid down by the instructor for classroom behavior. Students who fail to do so may be asked to leave the classroom.

Collaboration on Graded Assignments
Students may not work together on graded assignment unless the instructor gives express permission.

Course Evaluations
Course evaluations are important to us and to students who come after you. Please complete them thoughtfully.

Academic Integrity

Integrity is critical to the learning process and to all that we do here at NYU Stern. As members of our community, all students agree to abide by the NYU Stern Student Code of Conduct, which includes a commitment to:

• Exercise integrity in all aspects of one's academic work including, but not limited to, the preparation and completion of exams, papers and all other course requirements by not engaging in any method or means that provides an unfair advantage.
• Clearly acknowledge the work and efforts of others when submitting written work as one’s own. Ideas, data, direct quotations (which should be designated with quotation marks), paraphrasing, creative expression, or any other incorporation of the work of others should be fully referenced.
• Refrain from behaving in ways that knowingly support, assist, or in any way attempt to enable another person to engage in any violation of the Code of Conduct. Our support also includes reporting any observed violations of this Code of Conduct or other School and University policies that are deemed to adversely affect the NYU Stern community.
The entire Stern Student Code of Conduct applies to all students enrolled in Stern courses and can be found here:

Undergraduate College: http://www.stern.nyu.edu/uc/codeofconduct
Graduate Programs: http://w4.stern.nyu.edu/studentactivities/involved.cfm?doc_id=102505

To help ensure the integrity of our learning community, prose assignments you submit to Blackboard will be submitted to Turnitin. Turnitin will compare your submission to a database of prior submissions to Turnitin, current and archived Web pages, periodicals, journals, and publications. Additionally, your document will become part of the Turnitin database.

**Recording of Classes**

Your class may be recorded for educational purposes

**Students with Disabilities**

If you have a qualified disability and will require academic accommodation of any kind during this course, you must notify me at the beginning of the course and provide a letter from the Moses Center for Students with Disabilities (CSD, 998-4980, www.nyu.edu/csd) verifying your registration and outlining the accommodations they recommend. If you will need to take an exam at the CSD, you must submit a completed Exam Accommodations Form to them at least one week prior to the scheduled exam time to be guaranteed accommodation.

**Group Projects**

Guidelines for Group Projects

Business activities involve group effort. Consequently, learning how to work effectively in a group is a critical part of your business education.

Every member is expected to carry an equal share of the group’s workload. As such, it is in your interest to be involved in all aspects of the project. Even if you divide the work rather than work on each piece together, you are still responsible for each part. The group project will be graded as a whole: its different components will not be graded separately. Your exams may contain questions that are based on aspects of your group projects.

It is recommended that each group establish ground rules early in the process to facilitate your joint work including a problem-solving process for handling conflicts. In the infrequent case where you believe that a group member is not carrying out his or her fair share of work, you are
urged not to permit problems to develop to a point where they become serious. If you cannot resolve conflicts internally after your best efforts, they should be brought to my attention and I will work with you to find a resolution.

You will be asked to complete a peer evaluation form to evaluate the contribution of each of your group members (including your own contribution) at the conclusion of each project. If there is consensus that a group member did not contribute a fair share of work to the project, I will consider this feedback during grading.