

Syllabus

Stochastic Calculus

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	Position	Professor			Major	Financial Engineering
	Group	Financial Engineering				

1. Course Description

Students will learn basics of stochastic calculus with an objective to apply it to problems in financial engineering. The course will cover the following topics: stochastic processes, Brownian motions and Poisson processes, Ito integrals and Ito's lemma. We will also study the Malliavin calculus and its applications.

2. Teaching Methods

The course will consist mostly of lectures. The students, however, are encouraged to participate in class discussions through questions and debates. Presentation by students will be an important part of the course.

3. Evaluation

1. class participation 10%
2. research projects and presentations 30%
3. quizzes 40%
4. final exam 20%

4. TextBooks

5. Lecture Schedule

Week	Lecture contents	Lesson type	Remark
1	Review of general probability theory	lecture	
2	Information and Conditioning	lecture	
3	Information and Conditioning	lecture	
4	Brownian Motion 1	lecture	
5	Brownian Motion 2	lecture	
6	Ito Integral 1	lecture	
7	Ito Integral 2	lecture	
8	exam	lecture	
9	Ito's formula	lecture	
10	Ito's formula	lecture	
11	Black-Scholes-Merton equation	lecture	
12	Black-Scholes-Merton equation	lecture	
13	Multivariate stochastic calculus	lecture	
14	risk-neutral pricing	lecture	
15	risk-neutral pricing	lecture	
16	exam		

6. Others

Students are not required to have a great deal of preparation in mathematics. We will start from basics, slowly proceed to the core of topics.