

Class Syllabus

확률미적분 (Stochastic Calculus)

Professor	Name	Hyeong-Ohk Bae	Course	Target Student	Department	Financial Engineering
	Position	Professor			Major	Financial Engineering
	Department	Financial Engineering				

1. Overview of the Subject

In this subject, students learn the mathematical foundation of financial engineering, the probability calculus. We first learn about the stochastic processes, and learn about the Brownian motion and Poisson processes as special examples. Learn Ito Integration Theory and Ito's supplementary theorem, which underlie the theory of investment and financial products. And learn about Malliavin calculus and its application.

2. Overview of Teaching Method

The course consists 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. Grading

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

4. Textbook and References

	Title	Author	Publisher	Year
Textbook	Stochastic Calculus for Finance II	Shreve	Springer	2004

5. Class Plan

주 별	교 수 내 용	수업형태	비 고
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.