TOPICS IN INSURANCE AND FINANCE: INTRODUCTION TO LEVY PROCESSES AND APPLICATIONS AND MACHINE LEARNING IN RISK MANAGEMENT (m63112p)

Instructors: ST.VAKEROUDIS – K.GEORGIOU – P.PAPAIOANNOU

Core Course, 4th semester, 5 ECTS units
Course level: Graduate (MSc)
Language: Greek

Course Description

Review of Basic issues in Probability Theory and Stochastic Processes, Poisson Process, Brownian motion, Lévy Processes, Applications in Financial Mathematics, Interest Rate Models, Applications in Actuarial Sciences (Risk/Ruin Theory)

Prerequisites

Probability and applications using computational techniques
Stochastic Processes and Derivative Markets

Target Learning Outcomes

The students will be familiarized with practical problems and the respective management solutions from the financial/actuarial industry. They will acquire the mathematical background to be able to analyze, model, and solve the problems arising from the industry. They will be able to apply modern methods and propose novel approaches to attack each specific case.

Recommended Bibliography

- Stochastic Finance (notes), A. Yannacopoulos
- Introduction to Stochastic Calculus, D. Cheliotis
- Hull, J. C. (2015) Options, Futures, and Other Derivatives, 9th edition, Pearson
- McDonald, R. L. (2013), Derivatives Markets, 9th edition, Prentice Hall
- Shreve, S. (2005), Stochastic calculus for finance Vols. I and II, Springer
- An introduction to Lévy Processes with Applications in Finance, Lecture Notes, A. Papapantoleon
- Introductory Lectures on Fluctuations of Lévy Processes with Applications, A.E. Kyprianou
- Brigo D., Mercurio F. (2001) Interest Rate Models - Theory and Practice, Springer

Teaching and Learning Activities

One three-hour lecture per week (8 weeks).

Assessment and Grading Methods

The students will be graded by a final exam at the end of the lectures. Moreover, each student will submit a short essay with respect to a topic associated to the lectures during the semester.