

The Hebrew University of Jerusalem

Syllabus

Introduction to the mathematics of actuarial risk management - 52721

Last update 11-02-2016

HU Credits: 2

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: statistics

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: Mt. Scopus

Course/Module Coordinator: Prof Benjamin Yakir

Coordinator Email: benjamin.yakir@gmail.com

Coordinator Office Hours: Sundays to Wednesdays or by appointment

Teaching Staff:

Prof Benjamin Yakir

Course/Module description:

This course presents computational tools that are useful in deterministic and stochastic models of cashflow. These computations are the foundation for the considerations that guide actuaries in the insurance industry. The course is based on the content of the CT1 paper that is part of the UK Institute of Actuaries certification examination.

Course/Module aims:

The main objective is to present terms and computational tools for cashflow in the insurance industry. A secondary objective is to help students who are interested to prepare for certification examination.

Learning outcomes - On successful completion of this module, students should be able to:

1. Demonstrate understanding of the terms that appear in units of the Core Reading of CT1.
2. Solve questions from old CT1 examinations.
3. Solve questions that are similar to the questions that appear in old CT1 examinations.

Attendance requirements(%):

None

Teaching arrangement and method of instruction: The theoretical material of the course will be presented in the lectures. A list of questions from old CT1 examinations will be set. The students are required to learn independently the questions and understand the methods for solving them. The students can use the lecture time in order to clarify difficult subjects.

Course/Module Content:

- Unit 1. Generalised cashflow model
- Unit 2. The time value of money
- Unit 3. Interest rates
- Unit 4. Real and money interest rates
- Unit 5. Discounting and accumulating

Unit 6. Compound interest functions
Unit 7. Equations of value
Unit 8. Loan schedules
Unit 9. Project appraisal
Unit 10. Investments
Unit 11. Elementary compound interest problems
Unit 12. The “No Arbitrage” assumption and Forward Contracts
Unit 13. Term structure of interest rates
Unit 14. Stochastic interest rate models

Required Reading:

1. Class notes
2. Past years CT1 exams and solutions thereof

Additional Reading Material:

1. S. J. Garrett: *An Introduction to the Mathematics of Finance, A Deterministic Approach*. Elsevier.
2. ActEd, *Combined Materials Pack: Financial Mathematics, Subject CT1*

Course/Module evaluation:

End of year written/oral examination 60 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 40 %
Other 0 %

Additional information:

During the course there will be several exams. These exams will be computerized and will be based on CT1 past exams. Each student will select 4 exams to be scored. The score of each these exams will determine 10% of the final score. (The score for an exam is the larger between the mark of the final exam and the mark that was assigned to the exam).

The final exam and the computerized exams are given in English. The answers can be written in Hebrew.