Course Descriptions None 2017-2018

Course Title	Life Insurance I
Course Code	EBC4119
ECTS Credits	6,5
Assessment	None

Period

Period	Start	End	Mon	Tue	Wed	Thu	Fri
2	30-10-2017	22-12-2017	X			X	

Level	Advanced
Coordinator	Antoon Pelsser For more information:a.pelsser@maastrichtuniversity.nl
Language of instruction	English

Goals

In this course we aim to teach students the basic principles of pricing life-insurance and pension contract and basic principles of measuring value creation on a market-consistent basis (Market-Consistent Embedded Value).

The underlying principle for this course is the notion that the market-consistent value of a life-insurance or pension contract is based on the market-value of the Replicating Portfolio plus an 'add-on' for the remaining (unhedgeable) portions of the risk that are not covered by the Replicating Portfolio.

Description

1. Pricing by Replication: Role of the actuary; Basic idea fair value; Bonds; Forward rates; Duration; Inflation.
2. Non-Financial Risks: Non-hedgeable risks; Market value margin; Modelling of mortality; Utility-based pricing.
3. Equity Options: Unit linked insurance; Intro to option theory; Equity derivatives; With-profit policies.
4. Time-Consistent and Market-Consistent Pricing: Pricing financial & insurance risk simultaneously; Two-step pricing operator; Pricing in continuous time; Market-consistent embedded value.
5. Interest Rates: Interest rate swaps; Swaptions; Extrapolating the term-structure of interest rates.
6. Risk Management: Risk measures; Calculation of Value-at-Risk; Economic Capital; Solvency II.
7. Portfolio Replication: Cash flow output; Choosing objective function; Linear regression; Diagnostic statistics.

Study-load and grading :
* Study-load = 6.5 ECTS (= 182 study-hours).
* The course takes 7 weeks, with 4 contact hours every week plus mandatory homework assignments every week.
* Students work in groups of max. 4 students on the homework assignments. Each post-discussion two groups present their solution to the tutorial group, which will then be discussed by the tutorial group.
* Please note that the homework assignments are based on real-life cases. This means that the assignments are relatively unstructured. This also means that there is usually not a unique "correct" solution for the assignment. It is therefore important that students can motivate and defend the choices they have made to obtain their solution. Discussing the pro's and con's of different solutions will be an important aspect of the post-discussion.
* Average grade for all homework-presentations in the post-discussion counts for 50% of final grade. Final written exam counts for 50% of final grade.

Literature	To be announced.
Prerequisites	Bachelor Level Econometrics and Operations Research, including preparatory courses Actuarial Sciences.
Teaching methods	PBL / Lecture / Assignment
Assessment methods	Participation / Written Exam
Evaluation in previous academic year	For the complete evaluation of this course please click http://iwio-sbe.maastrichtuniversity.nl/rapporten.asp?referrer=codeUM

This course belongs to the following programme / specialisation

Master Econometrics and OR	Actuarial Science
Master Econometrics and OR	Econometrics & OR Electives
SBE Exchange Master	Master Exchange Courses
SBE Non Degree Courses	Master Courses