



GRADUATE SCHOOL

GM1012 Credit Risk Modelling, 7.5 higher education credits

Kreditriskmodellering, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by School of Business, Economics and Law on 2010-06-30 and was last revised on 2016-06-20 to be valid from 2016-08-29, autumn semester of 2016.

Field of education: Social Sciences 100%

Department: Graduate School

Position in the educational system

The course can be part of the following programmes: 1) Program in Environmental Social Science (S1SML), 2) Mathematical Sciences, Master's Programme (N2MAT), 3) Programme in Logistics management (S1LOM), 4) Master of Science in Economics (S2ECO), 5) Programme in Environmental Social Science (SMILM), 6) Master of Science in Finance (S2FIN), 7) Programme in Business and Economics (S1HEG) and 8) Programme in Business and Economics (S1HEM)

Main field of studies

Finance

Specialization

A1F, Second cycle, has second-cycle course/s as entry requirements

Entry requirements

To be eligible for the course Credit Risk Modelling the participant must fulfil the entrance qualifications for the Master of Science programme in Finance or Economics. For programme specific entrance requirements, see programme syllabus.

The participant must also have followed the courses Quantitative Finance, Investments, Mathematics, Graduate Econometrics and Financial Econometrics. Students with a proven extensive mathematical and statistical background may also be eligible for the

course.

Learning outcomes

After completion of the course, the student shall be able to:

1. Describe and explain firm-value models (such as e.g. Merton's model) and apply these models to solve practical problems within credit risk related issues
2. Describe and explain intensity-based models and apply them to solve practical problems within credit risk related issues
3. Describe and explain static portfolio credit risk models and apply these models to risk-management measures such as e.g. Value-at-Risk and Expected Shortfall
4. Describe and explain credit derivatives and apply credit risk models to calculate quantities related to these derivatives

Course content

Credit risk is the largest and most important risk any financial institution faces. The recent credit crises are striking proof of this fact. This course covers different topics in credit risk modeling; more specifically the topics are:

- Structural Models (Firm Value models): The Merton model
- Markov processes in credit risk, Markov Chains, Markov jump processes. The matrix-exponential and its properties, ratings etc
- Intensity based models in credit risk models.
- Pricing defaultable bonds using intensity based models
- Static credit portfolio models and their use in risk management computations such as Value-at-Risk and Expected shortfall
- The Credit Default Swap (CDS).
- Modeling and pricing a CDS
- The Index CDS and basket default swaps (k-th-to default swaps)
- Modelling and Pricing an index CDS and basked default swaps
- Basel III, Conterparty credit risk, credit value adjustment and related issues

Form of teaching

The teaching consists of lectures and computer labs. In the course two compulsory hand-in assignments are given where the student uses programming in Matlab to implement different models in order solve practical problems within credit risk related issues. The compulsory assignments are a central part of the course.

Language of instruction: English

Assessment

The learning outcomes are assessed through two compulsory hand-in assignments and a written exam.

In order to pass the course the student needs to pass on each compulsory hand-in assignment and pass on the written exam.

If a student, who has failed the same examined component twice, wishes to change examiner before the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance).

In cases where a course has been discontinued or has undergone major changes, the student shall normally be guaranteed at least three examination occasions (including the ordinary examination) during a period of at least one year from the last time the course was given.

Students who have made five unsuccessful attempts to pass an examination have lost the possibility of obtaining a Master of Science Degree from Graduate School.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

In order to pass the course the student needs to pass on each compulsory hand-in assignment and pass on the written exam.

Course evaluation

The course will be evaluated upon completion.

The results of and possible changes to the course will be shared with students who participated in the evaluation and students who are starting the course.