GRA 6535 Derivatives

Programme
Master of Science in Business, Master of Science in Business (Finance), Master of Science in Financial Economics, Specialization Course

Responsible for the course
Paul Ehling

Department
Department of Financial Economics

Term
According to study plan

ECTS Credits
6

Language of instruction
English

Introduction

Learning outcome
The course offers a thorough understanding of the workings and pricing of derivative securities. The course covers derivative markets, derivatives payoffs, and derivative strategies. This course will provide students with an understanding of the mathematics of arbitrage pricing, the binomial model, and the mathematics of continuous time (heuristically), the Black Scholes model, and applications of and adjustments to the Black Scholes model. The course also offers a heuristic introduction to numerical methods and simple numerical recipes.

Prerequisites
GRA 6532 Introduction to Derivatives and Risk Management or equivalent
GRA 6543 Introduction to Asset Pricing or equivalent
All courses in the Masters programme will assume that students have fulfilled the admission requirements for the programme. In addition, courses in second, third and/or fourth semester can have spesific prerequisites and will assume that students have followed normal study progression. For double degree and exchange students, please note that equivalent courses are accepted.

Compulsory reading
Books:
Hull, John C. 2015. Options, futures, and other derivatives. 9th ed., global ed. Pearson

Other:
During the course there may be hand-outs and other material on additional topics relevant for the course and the examination.
A list of compulsory readings will be provided on It's learning or in class.

Recommended reading

Course outline
1. *Introduction*
   a) Options markets
2. *Pricing*
   a) Binomial Trees
   b) Wiener Processes, Ito's Lemma, Black-Scholes-Merton and beyond
   c) The Greeks
3. *Numerical Methods and Applications*
   a) Empirical Performance of Option Pricing Models
   b) Numerical Techniques
   c) Exotic Options, Volatility Smiles, Risk Management
   d) Real Options and Credit Risk

Computer-based tools

Learning process and workload
A course of 6 ECTS credits corresponds to a workload of 160-180 hours.

Please note that while attendance is not compulsory in all courses, it is the student's own responsibility to obtain any information provided in class that is not included on the course homepage/It's learning or text book.

Examination
The course grade will be based on the following activities and weights:
60% - 3-hour written examination at the end of the course
20% - Class participation
20% - Take home examination

Form of assessment	Weight	Group size
Written examination 3 hours	60%	
Class participation	20%	
Take home examination	20%	

Specific information regarding student assessment will be provided in class. This information may be relevant to requirements for term papers or other hand-ins, and/or where class participation can be one of several components of the overall assessment. This is a course with continuous assessment (several exam components) and one final exam code. Each exam component is graded using points on a scale from 0-100. The final grade for the course is based on the aggregated mark of the course components. Each component is weighted as detailed in the course description. Students who fail to participate in one/some/all exam components will get a lower grade or may fail the course. You will find detailed information about the points system and the mapping scale in the student portal @bi.

Examination code(s)
GRA 65353 continuous assessment accounts for 100 % of the final grade in the course GRA 6535.

Examination support materials
BI approved exam calculator
Bilingual dictionary
Interest tables
Peter Berck og Knut Sydsæter. 1993. Economists' Mathematical Manual. 2nd ed. Berlin: Springer Verlag
Permitted examination support materials for written examinations are detailed under examination information in the student portal @bi. The section on support materials and the use of calculators and dictionaries should be paid special attention to.

Re-sit examination
It is only possible to retake an examination when the course is next taught. The assessment in some courses is based on more than one exam code. Where this is the case, you may retake only the assessed components of one of these exam codes. All retaken examinations will incur an additional fee. Please note that you need to retake the latest version of the course with updated course literature and assessment. Please make sure that you have familiarised yourself with the latest course description.

Additional information
Honor Code
Academic honesty and trust are important to all of us as individuals, and represent values that are encouraged and promoted by the honor code system. This is a most significant university tradition. Students are responsible for familiarizing themselves with the ideals of the honor code system, to which the faculty are also deeply committed.

Any violation of the honor code will be dealt with in accordance with BI's procedures for cheating. These issues are a serious matter to everyone associated with the programs at BI and are at the heart of the honor code and academic integrity. If you have any questions about your responsibilities under the honor code, please ask.