



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Optionsteori Option Theory

EXTF40, 7,5 credits, G2 (First Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED I

Date of Decision: 2023-04-14

General Information

Elective for: I4

Language of instruction: The course will be given in Swedish

Aim

The aim of the course is to provide knowledge of the valuation and pricing of option contracts.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

be able to:

- understand the basic functions of forward and option contracts,
- understand the theoretical pricing of forwards and options using the binomial model and the Black–Scholes model,
- understand the difference between the assumptions needed to price forward contracts and option contracts,
- explain how underlying variables affect the price of forwards and options,
- explain how Monte Carlo simulation can be used to price option contracts,
- generalise the knowledge to types of options that are not treated in the course.

Competences and skills

For a passing grade the student must

have demonstrated an ability to independently:

- use forward and option contracts for risk management purposes,
- apply different price setting methods,
- evaluate the assumptions of various price setting methods,
- analyse the price sensitivity of an option portfolio to the variables that determine option prices,
- carry out a Monte Carlo simulation to determine option prices.
- discuss option theory.

Students shall also have sufficient competence to individually write an empirically orientated paper.

Judgement and approach

For a passing grade the student must

Students shall have the ability to pursue further studies in the subject and should be able to search for and evaluate information with a high degree of independence. Students shall also have sufficient competence to individually write an empirically orientated paper.

Contents

The course deals with the theoretical valuation of European and American call and put options. Under the assumption of an arbitrage free market, the course identifies the boundaries within which option prices must be during the duration of the option. Using additional assumptions regarding the development of the underlying asset over time (its stochastic process), the exact price of the option is derived, using either the binomial model or the Black-Scholes model. The main aim of the course is to establish an understanding of standardised option contracts.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)

Assessment: The examination consists of a written exam and graded computer exercises. The written exam takes place at the end of the course. There will be further opportunities for examination close to this date. Points from the computer exercises can only be carried forward to examinations taken the same term.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Admission

Admission requirements:

- FMS012 Mathematical Statistics, Basic Course or FMSF45 Mathematical Statistics, Basic Course or FMSF80 Mathematical Statistics, Basic Course

The number of participants is limited to: No

The course overlaps following course/s: NEKH82, NEKK12, TEK040

Reading list

- Hull, John C.: Options, Futures and Other Derivatives, elfte upplagan. Pearson, 2021,

ISBN: 9781292410654. Hull, John C (2021): Options, Futures and Other Derivatives, eleventh edition, Pearson.

- Supplementary material.

Contact and other information

Course coordinator: Docent Birger Nilsson, birger.nilsson@nek.lu.se

Course homepage: <http://www.nek.lu.se/GU/GUB.asp>

Further information: Identical to NEKH82