Financial Derivatives

Course Outline
Academic Semester: 2025/26

1. General

School	**School of Finance and Statistics**		
Academic Unit	**Department of Banking and Financial Management**		
Level of Studies	**Undergraduate**		
Course Code	**ΧΡΠΑΞ01**		
Semester	**5th**		
Course Title	**Financial Derivatives**		
Idependent Teaching Activities		Weekly Teaching Hours	Credits
	Lectures	**4**	**7,5**
Course Type	**Compulsory / Scientific Expertise**		
Prerequite Courses			
Language of Instruction and Examinations	**Greek**		
Is the course offered to Erasmus Students?	**Yes (in Greek)**		
Url (Eclass)	**https://eclass.unipi.gr/modules/auth/courses.php?fc=64**		

2. Learning Outcomes

Learning Outcomes

This course focuses on the operational mechanisms of the derivative markets which constitute today an active sector of the international financial markets. Its main goal is to present the use of derivative products, such as Futures Contracts and Options, as well as their pricing techniques in alternative mathematical models. In addition, arbitrage strategies, investment strategies, hedging strategies and various measures of investment risk, related with the necessity of the financial derivatives, will be presented.

Upon successful completion of the course, the students will be able to

- know the main characteristics of basic financial derivative securities, as Futures/Forward Contracts and Option Contracts.
- use basic financial derivatives for the design of trading strategies, arbitrage strategies and hedging strategies.
- price basic financial derivatives via the discrete time Binomial Model.
- price basic financial derivatives via the continuous time Black-Scholes Model of Geometric Brownian motion.

interpret the main risk components, i.e. the Greek letters, of basic financial derivatives and use them for the risk management of dynamic portfolios.

General Competences

- Adapting to new situations.
- Decision-making.
- Individual/Independent work.
- Working in an interdisciplinary environment.
- Critical thinking.

- Development of free, creative and inductive thinking.

3. Syllabus

The following sections will be presented:

- Futures and Forward Contracts: Terminology – Payoffs – Standardization – Operation of Margins – Pricing – Arbitrage – Hedging
- Options Markets: Call and Put Option – Basic Positions – Payoffs and P/L Diagrams – Specification – Trading – Commissions – Margins – Warrants – Executive Stock Options – Convertible Bonds
- Properties of Stock Options: Basic Assumptions – Factors Affecting Option Prices – Arbitrage Bounds – Put-Call Parity – Early Exercise of American Options – The Effect of Dividends
- Trading Strategies Involving Options: Strategies Involving an Option and a Stock – Interpretation of Put-Call Parity – Bull Spread – Bear Spread – Butterfly Spread – Straddle – Strangle
- Binomial Model: One-Step Binomial Trees – Two-Step Binomial Trees – Pricing by Risk Free Portfolios – Risk Neutral Valuation – Pricing European Options – Pricing American Options – Delta Hedging
- Stochastic Processes and Itô's Lemma: Types of Stochastic Processes – Markov Property – Weak-Form Market Efficiency – Continuous Time Stochastic Processes – Wiener Processes – Generalized Wiener Processes – Itô Processes – The Process for Stock Prices and Interpretation of Parameters – Itô's Lemma and Applications
- Black & Scholes Model: Lognormal Property of Stock Prices – Distribution of Rate of Return – Historical Volatility – Black, Scholes & Merton PDE – Risk Neutral Valuation – Black & Scholes Pricing Formulas – Implied Volatility – Dividends Effect

The Greek Letters: Covered and Naked Positions – A Stop-Loss Strategy – Delta – Delta Hedging – Theta – Gamma – Relationship Among Delta, Theta and Gamma – Vega – Delta, Gamma and Vega Neutral Portfolios – Rho

4. Teaching and Learning Methods - Evaluation

Delivery	**In-class lecturing.**
Use of Information and Communications Technology	• **Use of lecture slides via PowerPoint.** • **Distribution of lecture slides to the students via an educational electronic platform.** • **Communication with students via e-mail.**
Teaching Methods	**Activity** / **Semester Workload** Lectures: 52 Independent Study: 135,5 **Course Total: 187,5**
Student Performance Evaluation	Written exam (100%) that includes: • Choice of questions. • Questions on theory. • Problem solving questions. This is a 2-hour written exam. The individual evaluation grades are explicitly written next to each question.

5. Attached Bibliography

Suggested Bibliography

- J. C. Hull, Βασικές Αρχές των Αγορών Συμβολαίων και Δικαιωμάτων, Εκδόσεις Κλειδάριθμος ΕΠΕ, Αθήνα, 2017.
- Θ. Πουφινάς – Χρ. Φλώρος, Χρηματοοικονομικά Παράγωγα, Εκδόσεις Ιωάννης Μούργκος, Αθήνα, 2014.
- C. Hull, Options, Futures, and Other Derivatives, 11th Edition, Pearson, 2022.

Related Academic Journals