Universität Regensburg

FAKULTÄT FÜR
WIRTSCHAFTSWISSENSCHAFTEN
Lehrstuhl für Statistik und
Risikomanagement

M.Sc. Course
Derivative Finanzinstrumente (Derivative Securities)
Course number 22 432 (Tutorial 22 433)

Examiner Prof. Dr. Daniel Rösch

Instructor Prof. Dr. Daniel Rösch

Tutorial Beatrix Schmitt

Course Objectives

The primary objectives of this course are to provide an introduction as well as an in-depth understanding of advanced issues, techniques, and methods in risk-neutral valuation and risk-management of derivatives instruments.

Specifically, the course covers important areas including characteristics and valuation of forwards, futures, swaps, and equity options, the binomial model as well as the Black–Scholes model for the valuation of options, the greeks and the analysis of options trading strategies. Similar emphasis is on providing an understanding in credit risk, its modeling from basic principles like default times, the analysis and valuation of credit risky instruments such as Credit Default Swaps (CDS) or Collateralized Debt Obligations (CDO) including tranche structures and their critical role during the financial crisis.

In short, the topics covered in the course include:

- Risk-neutral valuation, absence of arbitrage and martingales
- Stochastic processes and stochastic differential equations
- Valuation of forwards and futures
- Valuation of swaps
- Valuation of options
- Hedging, greeks, volatilities and volatility smiles
- Numerical methods in derivatives pricing
- Extensions and alternatives to the Black–Scholes–Merton framework
- Introduction to credit risk
- Valuation of Credit Default Swaps
- Valuation of Basket Default Swaps
- Valuation of securitizations and structured credit products
- Case studies

Primary Learning Outcomes

The students acquire the skills necessary to analyze standard derivatives products with respect to their main valuation principles, gain a deep understanding of the involved risk profiles and assess the risks faced by investors and financial institutions and the methods and markets through which these risks are managed.

The course aims at providing a balance between developing, on the one hand, the conceptual frameworks from the ground up and, on the other hand, knowledge and insights about the functioning and characteristics of financial markets enabling the students to make informed business decisions.

A main emphasis is on a tight connection of the theoretical concepts to practical aspects by accompanying lecture contents with real world case studies, IT based applications and guest lectures from practitioners since both aspects are

	essential to practitioners and academics alike.
Language	English
Prerequisites	none
Applicability of the MSc Module	WiWi - MSc - Finanzierung - Corporate Finance WiWi - MSc - Finanzmärkte - Financial Economics WiWi - MSc - Quantitative Finanzwirtschaft - Quantitative Finance
Frequency	Winter term
Recommended Semester	First M.Sc. semester
Examination	Written exam, 90 minutes
Workload	Workload: Overall: 180h (6 ECTS * 30h) Hours of presence: 60h Selfstudy: 120h
Credit Points	6 ECTS
Last updated	September 29, 2025