

Course Specifications

Valid as from the academic year 2024-2025

Financial Mathematics: Discrete Stochastic Models (C000242)

Course size	(nominal values; actual va	lues may depend on programme)			
Credits 6.0	Study time 165 h				
Course offerings and t	teaching methods in academi	c year 2024-2025			
A (semester 1)	Dutch	Gent	lecture independent wo seminar	rk	
Lecturers in academic	year 2024-2025				
Vyncke, David	avid WE02			lecturer-in-charge	
Offered in the followi	crdts	offering			
Master of Scienc	6	А			
Master of Scienc	6	А			
Teaching languages					
Dutch					
Keywords					
Stochastic model complete market	s, martingales, binomial model s, hedging	, financial derivatives, arbitrage,			
Position of the course					
This course introd and options. Usin most important c for the course "Fi	duces the students to the math g discrete stochastic models st concepts and techniques in fina nancial mathematics: continuo	ematics of financial markets, stocks udents get acquainted with the ncial mathematics, preparing them us stochastic models".			
Contents					
 Introduction to Probability the Binomial mode Arbitrage, risk- pricing Financial deriva options Optimal stoppin Cox-Ross-Rubir 	financial markets and instrum ory: martingales, Markov proces I: single-period, multi-period neutral pricing, complete mark atives: European put and call op ng theorem nstein pricing formula	ents ss, Radon-Nikodym theorem et, fundamental theorem of asset otions, American options, exotic			
Initial competences					
 Basic knowledgethe Bachelor of Preferably knowledgethe Bachelor of Course "Financial Course" 	ye of probability and statistics a ' Mathematics. wledge of deterministic financi al mathematics" in the minor E	as taught in the course Statistics I in al mathematics as taught in the conomics.			

- 1 Describe financial markets and instruments.
- 2 Analyze, discuss and apply probabilistic concepts and properties from financial mathematics.
- 3 Build and discuss the binomial market model.
- 4 Explain the fundamental concepts in financial mathematics (arbitrage, complete market, ...) and apply them to the binomial market model.
- 5 Identify and discuss financial derivatives.
- 6 Calculate the price of financial derivatives in a correct and efficient way.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Seminar, Lecture, Independent work

Study material

Type: Handbook

Name: Stochastic Calculus for Finance I Indicative price: € 40 Optional: no Language : English Author : Steven E. Shreve ISBN : 978-0-38724-968-1 Number of Pages : 187

References

- T. Björk; Arbitrage Theory in Continuous Time (Oxford University Press, 1998)
- P. Glasserman, Monte Carlo Methods in Financial Engineering (Springer, 2004)
- J. Hull; Options, Futures and other Derivatives (Prentice Hall, 2000)
- P. Wilmott, S. Howison, J. Dewynne; The Mathematics of Financial Derivatives: A Student Introduction (Cambridge University Press, 1995)

Course content-related study coaching

Interactive coaching via Ufora (forum); appointment by email

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Written assessment

Examination methods in case of periodic assessment during the second examination period

Written assessment

Examination methods in case of permanent assessment

Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

- Permanent evaluation: project
- Periodic evaluation: written exam

Calculation of the examination mark

The final score is a weighted average of the periodic evaluation (75%) and the permanent evaluation (25%).

Students however must pass both parts to pass the course. Otherwise, a final score of 10 or more to 20 will be reduced to 9/20.