

# Course Descriptions None 2026-2027

Course Title Mathematical Finance  
 Course Code EBC4121  
 ECTS Credits 6,5  
 Assessment Whole/Half Grades

Period	Start	End	Mon	Tue	Wed	Thu	Fri
2	26-10-2026	11-12-2026		X			X
4	1-2-2027	25-3-2027		X			X

Level Advanced  
 Coordinator Antoon Pelsser For more information:a.pelsser@maastrichtuniversity.nl  
 Language of instruction English

Goals The principal aim of this course is to provide students with an appreciation and understanding of how the application of mathematics, particularly stochastic mathematics, to the field of finance may be used to illuminate this field and model its randomness, resulting in greater understanding and quantification of investment returns and security prices.

Description The principal aim of this course is to show how stochastic mathematics can be used for the pricing and risk management of option contracts, and complex contingent claims in general. The course aims to provide a clear understanding of the intuition behind derivatives pricing, how models are implemented, and how they are used and adapted in practice. Strengths and weaknesses of different models, e.g., Black–Scholes, interest rate models, stochastic volatility, are examined. Both the theory and the implementation of the industry-standard models are considered in detail. Pricing problems are approached using multiple techniques including the well-known PDE, Monte-Carlo and martingale approaches.

Students should have knowledge of stochastic processes, in particular Brownian Motion, geometric Brownian motion and the underlying stochastic differential equations. Moreover, students should be familiar with the Ito integral and the Ito formula. Please note that computer programming skills are required for all the cases, as these involve numerical calculations.

Literature Joshi, M (2008) The Concepts and Practice of Mathematical Finance, 2nd ed, Cambridge University Press. ISBN: 978-0-521-51408-8

Prerequisites Students should have knowledge of stochastic processes, in particular Brownian motion, geometric Brownian motion and the underlying stochastic differential equations. Moreover, students should be familiar with the Ito integral and the Ito formula. Knowledge of the Girsanov transformation is helpful, but not required.

Transitional Regulations <div class="trreg"><ul class="trcohorts">Master Econometrics and Operations Research [2025-2026 and earlier]</ul><ol><li>In 2026-2027 education (period 2) and exam/resit ("Exam period 2"/"Resits period 2 & 3 courses") opportunities are offered.</li><li>In 2027-2028 exam/resit ("Exam period 2"/"Resits period 2 & 3 courses") opportunities are offered.</li></ol><p>Note that from 2026-2027 onwards, EBC4121 "Mathematical Finance" can also be taken in period 4.</p><table><col style="width: 200px;"><col style="width: 120px;"><thead><tr><th>Academic Year</th><th>Education</th><th>Exam/Resit</th><th>Replacement(s)</th></tr></thead><tbody><tr><td>2026-2027 period 2</td><td>X</td><td>X</td><td>EBC4121 "Mathematical Finance" in period 4</td></tr><tr><td>2027-2028 period 2</td><td>&nbsp;</td><td>X</td><td>EBC4121 "Mathematical Finance" in period 4</td></tr><tr><td>2028-2029 onwards</td><td>&nbsp;</td><td>&nbsp;</td><td>EBC4121 "Mathematical Finance" in period 4</td></tr></tbody></table></div>

Teaching methods Lecture / Assignment  
 Assessment methods Assignment

Evaluation in previous academic year For the complete evaluation of this course please click <http://iwio-sbe.maastrichtuniversity.nl/rapporten.asp?referrer=codeUM>

This course belongs to the following programme / specialisation	Master Econometrics and Operations Research	Elective Courses
	SBE Exchange Master	Master Exchange Courses
	SBE Non Degree Courses	Master Courses