Course Descriptions None 2026-2027

Course Title	Stochastic Processes
Course Code	EBC4004
ECTS Credits	6,5
Assessment	Whole/Half Grades

Period

Period	Start	End	Mon	Tue	Wed	Thu	Fri
1	31-8-2026	16-10-2026		X	L		

Level	Advanced
Coordinator	Michael Eichler For more information:m.eichler@maastrichtuniversity.nl
Language of instruction	English
Goals	The purpose of the course is to introduce students to the study of stochastic processes in discrete and continuous time. Students will have learned the essentials of the subject and should be able to apply the acquired theoretical tools to problems in econometrics, economics, finance, and other fields.
Description	Deterministic dynamic systems are usually not well suited for modelling real world dynamics in economics, finance and business. Allowing for random components in dynamic systems leads to stochastic dynamic modelling, which is based on stochastic processes. This course covers models of stochastic processes in discrete and continuous time. This includes Markov chains, Poisson processes and Brownian motion. We introduce various tools that are very useful for deriving and understanding the asymptotic properties of modern econometric techniques. They include the functional central limit theorem and stochastic integrals. Finally, we discuss stochastic differential equations and their applications in finance and related fields, e.g. for pricing financial derivatives.
Literature	Mikosch, T., (1998), Elementary stochastic calculus, World scientific Publishing, Singapore. Reader.
Prerequisites	* Only Master students can take Econometrics Master courses. * Students require a solid background in mathematical statistics and probability theory on the level of the BSc Econometrics programme. * An advanced level of English.
Transitional Regulations	<div class="trreg"><ul class="trcohorts"> - Master Business Research - No specialisation - Master Business Research - Operations Research - In 2024-2025 and 2025-2026 education and exam/resit opportunities are offered. - In 2026-2027 exam/resit opportunities are offered. - From 2027-2028 onwards, the course is cancelled. <table><col style="width: 200px;"><col style="width: 120px;"><col style="width: 120px;"><col><thead><tr><th>Academic Year</th><th>Education</th><th>Exam/Resit</th><th>Replacement(s)</th></tr></thead><tbody><tr><td>2024-2025 - 2025-2026</td><td>X</td><td>X</td><td> </td></tr><tr><td>2026-2027</td><td> </td><td>X</td><td> </td></tr><tr><td>2027-2028 onwards</td><td> </td><td> </td><td> </td></tr></tbody></table> <ul class="trcohorts"> - Master Econometrics and Operations Research [2025-2026 and earlier] - Master Economics and Financial Research [2025-2026 and earlier] - In 2026-2027 education and exam/resit opportunities are offered. - In 2027-2028 exam/resit opportunities are offered. - In 2028-2029, the course is cancelled. <p>Note that from 2026-2027 onwards, EBC4008 "Time Series Econometrics" is offered as a replacement course. If you have already succesfully completed EBC4008, replacement course is EBC4286 "Convex Optimisation for Data Science and AI".</p><table><col style="width: 200px;"><col style="width: 120px;"><col style="width: 120px;"><col><thead><tr><th>Academic Year</th><th>Education</th><th>Exam/Resit</th><th>Replacement(s)</th></tr></thead><tbody><tr><td>2026-2027</td><td>X</td><td>X</td><td>EBC4008 "Time Series Econometrics". If you have already succesfully completed EBC4008, replacement course is EBC4286 "Convex Optimisation for Data Science and AI".</td></tr><tr><td>2027-2028</td><td> </td><td>X</td><td>EBC4008 "Time Series Econometrics". If you have already succesfully completed EBC4008, replacement course is EBC4286 "Convex Optimisation for Data Science and AI".</td></tr><tr><td>2028-2029</td><td> </td><td> </td><td>EBC4008 "Time Series Econometrics". If you have already succesfully completed EBC4008, replacement course is EBC4286 "Convex Optimisation for Data Science and AI".</td></tr></tbody></table> <ul class="trcohorts"> - Master Financial Economics [2025-2026 and earlier] - In 2026-2027 and 2027-2028 exam/resit opportunities are offered. - In 2028-2029, the course is cancelled. <table><col style="width: 200px;"><col style="width: 120px;"><col style="width: 120px;"><col><thead><tr><th>Academic Year</th><th>Education</th><th>Exam/Resit</th><th>Replacement(s)</th></tr></thead><tbody><tr><td>2026-2027 - 2027-2028</td><td> </td><td>X</td><td> </td></tr><tr><td>2028-2029</td><td> </td><td> </td><td> </td></tr></tbody></table></div>
Teaching methods	PBL / Lecture / Assignment
Assessment methods	Participation / Written Exam
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 Business Research - No specialisation	In transition - Year 2 Methodology Electives
Master Business Research - Operations Research	In transition - Year 1 Compulsory Courses
Master Econometrics and Operations Research	In transition - Compulsory Courses
Master Economic and Financial Research - Econometrics and Operations Research	In transition - Year 1 Compulsory Courses
Master Economic and Financial Research - No specialisation	In transition - Elective Courses
Master Financial Economics - Asset Pricing	In transition - Elective Courses
Master Financial Economics - Banking	In transition - Elective Courses
Master Financial Economics - Financial Analysis	In transition - Elective Courses
Master Financial Economics - No specialisation	In transition - Elective Courses
SBE Exchange Master	Cancelled
SBE Non Degree Courses	Cancelled