# Course Descriptions None 2025-2026

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

Period

| Period | Start | End | Mon | Tue | Wed | Thu | Fri |
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| 1 | 1-9-2025 | 17-10-2025 | | X | L | | |

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| 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.<br>Reader. |
| Prerequisites | <ul><li>Only Master students can take Econometrics Master courses.</li><li>Students require a solid background in mathematical statistics and probability theory on the level of the BSc Econometrics programme.</li><li>An advanced level of English.</li></ul> |
| Transitional Regulations | TRANSITIONAL REGULATIONS <ul class="trcohorts"><li>Master Business Research</li><li>Master Business Research - Operations Research</li></ul><ol><li>In 2024-2025 and 2025-2026 education and exam/resit opportunities are offered.</li><li>In 2026-2027 exam/resit opportunities are offered.</li><li>From 2027-2028 onwards, the course is cancelled.</li></ol><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> |
| 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

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| Master Business Research - No specialisation | In transition - Y2 Methodology Electives |
| Master Business Research - Operations Research | In transition - Year 1 Compulsory Courses |
| Master Econometrics and Operations Research | Compulsory Courses |
| Master Economic and Financial Research - Econometrics | Year 1 Compulsory Courses |
| Master Economic and Financial Research - No specialisation | Elective Courses |
| Master Financial Economics - Asset Pricing | Elective Courses |
| Master Financial Economics - Banking | Elective Courses |
| Master Financial Economics - Financial Analysis | Elective Courses |
| Master Financial Economics - No specialisation | Elective Courses |
| SBE Exchange Master | Master Exchange Courses |
| SBE Non Degree Courses | Master Courses |