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| **Module description** | **Group Theory** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-Gru2** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 1st semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Algebra and Introduction to Group Theory or comparable knowledge | | |
| Course aims | • Skill to calculate in classic groups (with matrices and forms)<br>• Calculation with automorphisms of geometric structures<br>• Understanding free and universal constructions<br>• Understanding the significance of simple groups | | |
| Contents of module | • Classic groups (or Lie-type-groups) (simplicity of at least $PSL_n(K)$)<br>• Symmetry groups of geometric and algebraic structures<br>• Free groups (incl. generated groups and relations, free and amalgamated products, central extensions)<br>• Finite group theory | | |
| Form(s) of instruction | Lecture: 4 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 270 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | 90 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 9 CP | | |
| Frequency,<br>duration in semesters | Every other winter semester,<br>1 semester | | |
| Intake capacity | 30 | | |
| Language of instruction | German | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Special Lecture Group or Representation Theory 1** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-Gru3** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 3rd semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Group Theory | | |
| Course aims | A more profound understanding of an area of Group or Representation Theory | | |
| Contents of module | Taken from a special topic, as for example<br>• Reflection groups<br>• Chevalley groups<br>• Structures<br>• Modular representation theory<br>• Finite simple groups | | |
| Form(s) of instruction | Lecture: 4 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 270 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | 90 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 9 CP | | |
| Frequency,<br>duration in semesters | Every other winter semester,<br>1 semester | | |
| Intake capacity | 20 | | |
| Language of instruction | German or English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Special Lecture Group or Representation Theory 2** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-Gru4** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 3rd semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Group Theory | | |
| Course aims | A more profound understanding of an area of Group or Representation Theory | | |
| Contents of module | Taken from a special topic, as for example<br>• Lie-type-groups<br>• Application of the classification of finite simple groups<br>• Representation theory of Chevalley groups | | |
| Form(s) of instruction | Lecture: 2 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 180 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 30 h | 30 h |
| | Ab preparation / follow-up work | 30 h | 60 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 6 CP | | |
| Frequency,<br>duration in semesters | Every other winter semester,<br>1 semester | | |
| Intake capacity | 20 | | |
| Language of instruction | German or English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Reading Course Algebra Master** | |
|---|---|---|
| **Module code** | **07-M/BA-AlgM** | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | |
| Applies to degree courses / semesters | MSc Mathematics / 2nd semester | |
| Module coordinator | Cf. German Version | |
| Advice on module | see notice board | |
| Prerequisites | Group Theory | |
| Course aims | • Skill to independently study the course literature and research<br>• Skill to complete drafted proofs<br>• Skill to analyse a counter-example<br>• Presentation and explanation of the texts that were studied | |
| Contents of module | E.g.<br>• Structures and Lie-type-groups<br>• Modular representation theory<br>• Finite simple groups | |
| Form(s) of instruction | Reading course: 2 h per week | |
| Total workload in hours | 180 | |
| | consisting of:<br>A courses | Reading course |
| | Aa contact hours | 30 h |
| | Ab preparation / follow-up work | 135 h |
| | B autonomous work in the module | |
| | C module examination | 15 h preparation and examination |
| Module examination | Written or oral examination | |
| Credit points | 6 CP | |
| Frequency,<br>duration in semesters | Every other summer semester,<br>1 semester | |
| Intake capacity | 10 | |
| Language of instruction | English | |
| Date | see course catalogue | |
| Reading list | see notice board | |

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| **Module description** | **Reading Course Analysis Master** | |
|---|---|---|
| **Module code** | **07-M/MA--AnLM** | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | |
| Applies to degree courses / semesters | MSc Mathematics / 3rd or 4th semester | |
| Module coordinator | Cf. German Version | |
| Advice on module | see notice board | |
| Prerequisites | Modules Functional Analysis or Hilbert Space Theory or comparable knowledge | |
| Course aims | Independent study of course literature with analysis and addition of proofs; presentation of the learned subjects | |
| Contents of module | Topics from the areas of partial differential equations, dynamical systems, functional differential equations. | |
| Form(s) of instruction | Reading course: 2 h per week | |
| Total workload in hours | 180 | |
| | consisting of:<br>A courses | Reading course |
| | Aa contact hours | 30 h |
| | Ab preparation / follow-up work | 60 h |
| | B autonomous work in the module | 75 h literature study |
| | C module examination | 15 h preparation and examination |
| Module examination | Written or oral examination | |
| Credit points | 6 CP | |
| Frequency,<br>duration in semesters | Irregular,<br>1 semester | |
| Intake capacity | | |
| Language of instruction | German / English | |
| Date | see course catalogue | |
| Reading list | see notice board | |

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| **Module description** | **Advanced Course Analysis Master** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-AnSM** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / from 1st semester onwards | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Modules Functional Analysis or Hilbert Space Theory or comparable knowledge | | |
| Course aims | A more profound understanding of an area of analysis on an advanced level. | | |
| Contents of module | Taken from a special branch of analysis, as for example partial differential equations, mathematical physics, functional differential equations, etc. | | |
| Form(s) of instruction | Lecture: 4 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 270 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | 90 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 9 CP | | |
| Frequency,<br>duration in semesters | Every winter semester,<br>1 semester | | |
| Intake capacity | 200 | | |
| Language of instruction | German / English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Algebraic Topology** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-ATop** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 2nd or 4th semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Modules Analysis 1 – 2, Linear Algebra/Analytical Geometry 1 – 2, Algebra or comparable knowledge | | |
| Course aims | The students should be familiar with the fundamental terms and methods of algebraic topology. | | |
| Contents of module | • Fundamental terms of homotopy theory<br>• Singular homology theory<br>• Eilenberg-Steenrod axioms and consequences<br>• Cohomology and cup product | | |
| Form(s) of instruction | Lecture: 3 h per week, Tutorial: 1 h per week | | |
| Total workload in hours | 180 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 45 h | 15 h |
| | Ab preparation / follow-up work | 45 h | 45 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 6 CP | | |
| Frequency,<br>duration in semesters | Irregular, about every fourth semester,<br>1 semester | | |
| Intake capacity | 200 | | |
| Language of instruction | German / English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Dynamical Systems** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-Dyn** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 2nd or 4th semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Modules Analysis 1 – 3, Linear Algebra/Analytical Geometry 1 – 2 or comparable knowledge | | |
| Course aims | Knowledge and application of concepts of the theory of dynamical systems; understanding, leading and depicting of proofs in this area. | | |
| Contents of module | Vector fields and flows, linearisation, local invariant manifolds, limes set, stability. Possibly periodic orbits and Poincaré map, introduction to chaotic dynamics. | | |
| Form(s) of instruction | Lecture: 4 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 270 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | 90 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 9 CP | | |
| Frequency,<br>duration in semesters | Every other summer semester, alternating with Partial Differential Equations,<br>1 semester | | |
| Intake capacity | 200 | | |
| Language of instruction | German / English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Functional Analysis** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-Fun** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / from 1st semester onwards | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Modules Analysis 1 – 4 or corresponding knowledge | | |
| Course aims | Familiarity with the fundamentals of linear functional analysis, especially in Banach spaces. | | |
| Contents of module | Banach spaces, limited, compact, Fredholm operators, Hahn-Banach theorems and Banach theorems, dual space and weak topology. Possibly non-linear compact operators (examples). | | |
| Form(s) of instruction | Lecture: 4 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 270 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | 90 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 9 CP | | |
| Frequency,<br>duration in semesters | Every other winter semester, alternating with Hilbert Space Theory,<br>1 semester | | |
| Intake capacity | 200 | | |
| Language of instruction | German / English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Hilbert Space Theory** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-Hil** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / from 1st semester onwards | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Modules Analysis 1 – 4 or corresponding knowledge | | |
| Course aims | Familiarity with the fundamental concept formations in the Hilbert space as well as with examples of application | | |
| Contents of module | The term of the Hilbert space, orthogonality and orthonormal bases, symmetric and self-adjoint, limited and unlimited operators, unitary operators, spectral theory | | |
| Form(s) of instruction | Lecture: 4 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 270 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | 90 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 9 CP | | |
| Frequency,<br>duration in semesters | Every other winter semester, alternating with Functional Analysis,<br>1 semester | | |
| Intake capacity | 200 | | |
| Language of instruction | German / English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Non-linear Functional Analysis** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-NFA** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / from 1st semester onwards | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Modules Analysis 1 – 3 or corresponding knowledge | | |
| Course aims | The students should be familiar with the fundamental terms and propositions of non-linear functional analysis, especially with the degree of a continuous mapping. | | |
| Contents of module | • Degree of a continuous mapping of Brouwer with applications<br>• Leray-Schauder degree<br>• Fixed point theorems with applications<br>• Theory of ramification | | |
| Form(s) of instruction | Lecture: 3 h per week, Tutorial: 1 h per week | | |
| Total workload in hours | 180 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 45 h | 15 h |
| | Ab preparation / follow-up work | 45 h | 45 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 6 CP | | |
| Frequency,<br>duration in semesters | Irregular, about every fourth semester,<br>1 semester | | |
| Intake capacity | 200 | | |
| Language of instruction | German / English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Partial Differential Equations** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-PDG** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / from 1st semester onwards | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Analysis 1 – 2, Linear Algebra/Analytical Geometry 1 – 2 or corresponding knowledge; fundamentals in Functional Analysis or Hilbert Space Theory | | |
| Course aims | The students should be familiar with the most important classes of partial differential equations, with tasks on boundary value and eigenvalue as well as with methods for their solution. | | |
| Contents of module | • Linear elliptic, parabolic and hyperbolic partial differential equations and boundary value problems<br>• Harmonic functions, average feature, maximum principle<br>• Dirichlet's principle and variation methods, weak solution<br>• Eigenvalue problems, esp. eigenvalues of the Laplace operator | | |
| Form(s) of instruction | Lecture: 4 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 270 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | 90 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 9 CP | | |
| Frequency,<br>duration in semesters | Every other summer semester, alternating with Dynamical Systems,<br>1 semester | | |
| Intake capacity | 200 | | |
| Language of instruction | German / English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

| **Module description** | **Coding Theory** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-Cod** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / from 1st semester onwards | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Linear Algebra/Analytical Geometry 1, Linear Algebra/Analytical Geometry 2, Algebra | | |
| Course aims | Learning about the matters and concepts of coding theory.<br>Knowledge of the most important codes.<br>Knowledge of the features of linear and cyclic codes.<br>Commanding coding and decoding methods. | | |
| Contents of module | Shannon's theorem,<br>Linear codes, cyclic codes,<br>Important codes (e.g. Reed-Muller codes and BCH-codes),<br>Bounds for codes (especially Plotkin, Griesmer, sphere-packing bound) and codes that take on the bounds.<br>Coding and decoding methods.<br>Further changing focuses, e.g.: classification of perfect codes, codes above $Z_4$, Goppa codes, Justensen codes. | | |
| Form(s) of instruction | Lecture: 4 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 270 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | 90 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 9 CP | | |
| Frequency,<br>duration in semesters | Irregular in winter semester,<br>1 semester | | |
| Intake capacity | 50 | | |
| Language of instruction | German | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Cryptography** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-Kry** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 2nd semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | | | |
| Course aims | • Commanding the concepts of symmetric and asymmetric cryptography.<br>• Learning the handling of the most important security terms.<br>• Understanding the fundamental ideas of stream ciphers and block ciphers.<br>• Understanding various techniques of cryptoanalysis and learning to apply them.<br>• Understanding and application of various public-key cryptography and signatory methods.<br>• Learning and strengthening the handling of the concept of zero-knowledge protocols.<br>• Overview of different applications in which cryptographic protocols are used. | | |
| Contents of module | • Security terms: types of attacks, perfect security, perfect indistinguishability<br>• Stream ciphers: One-Time-Pad, pseudorandom numbers, statistical tests, linear shift registers, linear complexity, applications in mobile telephony<br>• Block ciphers: design criteria, product ciphers and Feistel ciphers, modern algorithms, cryptoanalysis, cascades and modes of operating<br>• Authenticity of notifications and users: Hash functions, message authentication codes, fixed and rolling code methods, challenge-and-response protocols<br>• Key establishment protocols: attacks, key transport protocols<br>• RSA-algorithms: key generation, coding and decoding, signatory<br>• Discrete logarithm: Diffie-Hellman key agreement, ElGamal-coding and signatory<br>• Security public-key methods: polynomial indistinguishability, semantic security, security of different public-key coding methods, security of different signatory methods<br>• Zero-knowledge protocols: different protocols, formalisation, authentication with zero-knowledge-protocols<br>• Key administration: cryptographic and organisatoric measures, public-key infrastructures, public-key certificates, key agreement protocols<br>• Multiparty-computations: secret-sharing method, barrier schemata, verifiable secret-sharing<br>• Anonymity: MIX-nets, blind signatories, electronic choices, electronic money | | |
| Form(s) of instruction | Lecture: 4 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 270 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | 90 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 9 CP | | |
| Frequency,<br>duration in semesters | Every summer semester,<br>1 semester | | |
| Intake capacity | 50 | | |
| Language of instruction | German | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

| **Module description** | **Advanced Course Cryptography** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-PGC** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 3rd semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Bachelor, module Cryptography | | |
| Course aims | Acquiring a more profound knowledge of the course aims stated in the module Cryptography. | | |
| Contents of module | Selected topics of cryptography. | | |
| Form(s) of instruction | Lecture: 2 h per week, Tutorial: 1h per week | | |
| Total workload in hours | 180 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 30 h | 15 h |
| | Ab preparation / follow-up work | 30 h | 90 h |
| | B autonomous work in the module | | |
| | C module examination | 15 h | |
| Module examination | Examination: written or oral examination. | | |
| Credit points | 6 CP | | |
| Frequency,<br>duration in semesters | winter semester,<br>1 semester | | |
| Intake capacity | 30 | | |
| Language of instruction | see extra list of current semester (StudIP) | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

| **Module description** | **Projective Geometry 2** | |
|---|---|---|
| **Module code** | **07-M/MA-PG2** | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | |
| Applies to degree courses / semesters | MSc Mathematics / from 1st semester onwards | |
| Module coordinator | Cf. German Version | |
| Advice on module | see notice board | |
| Prerequisites | Linear Algebra/Analytical Geometry 1, Algebra, Projective Geometry 1 | |
| Course aims | Acquiring a more profound knowledge of the course aims stated in Projective Geometry 1.<br>Insights into the structure of polar spaces. | |
| Contents of module | Quadric surfaces (continuation from PG1)<br>Hermitian and unitary polar spaces<br>Isomorphisms and dualities between polar spaces: Klein correspondence, triality<br>Current research results in the area of finite projective geometry, for example about fibration and ovoids in polar spaces | |
| Form(s) of instruction | Lecture 4 h per week | |
| Total workload in hours | 180 | |
| | consisting of:<br>A courses | Lecture |
| | Aa contact hours | 60 h |
| | Ab preparation / follow-up work | 90 h |
| | B autonomous work in the module | |
| | C module examination | 30 h |
| Module examination | Written or oral examination | |
| Credit points | 6 CP | |
| Frequency,<br>duration in semesters | Irregular in summer semester,<br>1 semester | |
| Intake capacity | 50 | |
| Language of instruction | German | |
| Date | see course catalogue | |
| Reading list | see notice board | |

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

| **Module description** | **Advanced Course Projective Geometry and Codes** | |
|---|---|---|
| **Module code** | **07-M/MA-PGC** | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | |
| Applies to degree courses / semesters | MSc Mathematics / from 1st semester onwards | |
| Module coordinator | Cf. German Version | |
| Advice on module | see notice board | |
| Prerequisites | Linear Algebra/Analytical Geometry 1 – 2, Algebra,<br>Projective Geometry 1 – 2 | |
| Course aims | The students shall become acquainted with current research areas and problems | |
| Contents of module | Recent results from the fields of projective geometry and coding theory | |
| Form(s) of instruction | Lecture 4 h per week | |
| Total workload in hours | 180 | |
| | consisting of:<br>A courses | Lecture |
| | Aa contact hours | 60 h |
| | Ab preparation / follow-up work | 90 h |
| | B autonomous work in the module | |
| | C module examination | 30 h |
| Module examination | Examination: written or oral examination. | |
| Credit points | 6 CP | |
| Frequency,<br>duration in semesters | Irregular,<br>1 semester | |
| Intake capacity | 50 | |
| Language of instruction | German | |
| Date | see course catalogue | |
| Reading list | see notice board | |

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

| **Module description** | **Approximation Theory with Seminar** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-AppS** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 1st or 3rd semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Analysis 1, 2 and Linear Algebra/Analytical Geometry 1, 2 or comparable knowledge | | |
| Course aims | Skill to apply and analyse approximation methods as well as their mathematical analysis: existence, uniqueness, convergence. | | |
| Contents of module | Fundamentals of approximation theory;<br>Polynomial approximation, approximation order (Jackson theorems);<br>Minimax approximations;<br>Spline approximation / approximations with rational functions;<br>Multidimensional approximation / approximation with translation-invariant spaces. | | |
| Form(s) of instruction | Lecture: 4 h per week, Seminar: 2 h per week | | |
| Total workload in hours | 330 | | |
| | consisting of:<br>A courses | Lecture | Seminar |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | |
| | B autonomous work in the module | 150 h preparation and elaboration of the seminar presentation | |
| | C module examination | 30 h preparation and examination | |
| Module-component examination | Written or oral examination, presentation, elaboration make in each case up 50%, 30%, 20% of the grade. | | |
| Credit points | 11 CP | | |
| Frequency,<br>duration in semesters | Every other winter semester,<br>1 semester | | |
| Intake capacity | 15 | | |
| Language of instruction | German or English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Computer Algebra with Seminar** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-CAlS** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / from 1st semester onwards | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Analysis 1, 2 and Linear Algebra/Analytical Geometry 1, 2 or comparable knowledge | | |
| Course aims | Understanding the fundamental concepts of efficient computer algebra relevant to problems of application. | | |
| Contents of module | Integer arithmetic and rational arithmetic;<br>Calculation with univariate polynomials;<br>Multivariate polynomials and constructive ideal theory;<br>Solving of polynomial systems of equations. | | |
| Form(s) of instruction | Lecture: 4 h per week, Seminar: 2 h per week | | |
| Total workload in hours | 330 | | |
| | consisting of:<br>A courses | Lecture | Seminar |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | |
| | B autonomous work in the module | 150 h preparation and elaboration of the seminar presentation | |
| | C module examination | 30 h preparation and examination | |
| Module-component examination | Written or oral examination, presentation, elaboration make in each case up 50%, 30%, 20% of the grade. | | |
| Credit points | 11 CP | | |
| Frequency,<br>duration in semesters | Every other summer semester,<br>1 semester | | |
| Intake capacity | 15 | | |
| Language of instruction | German or English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Multi-dimensional Approximation Theory with Seminar** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-MApS** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / from 2nd semester onwards | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Analysis 1, 2 and Linear Algebra/Analytical Geometry 1, 2 or comparable knowledge | | |
| Course aims | Skill to apply and analyse approximation methods as well as their mathematical analysis: existence, uniqueness, convergence. | | |
| Contents of module | Fundamentals of multidimensional approximation theory;<br>Polynomial approximation, spline approximation;<br>Approximation with spaces of radial base functions; multidimensional wavelets. | | |
| Form(s) of instruction | Lecture: 4 h per week, Seminar: 2 h per week | | |
| Total workload in hours | 330 | | |
| | consisting of:<br>A courses | Lecture | Seminar |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | |
| | B autonomous work in the module | 150 h preparation and elaboration of the seminar presentation | |
| | C module examination | 30 h preparation and examination | |
| Module-component examination | Written or oral examination, presentation, elaboration make in each case up 50%, 30%, 20% of the grade. | | |
| Credit points | 11 CP | | |
| Frequency,<br>duration in semesters | Every other winter semester,<br>1 semester | | |
| Intake capacity | 15 | | |
| Language of instruction | German or English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Wavelets with Seminar** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-WavS** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / from 1st semester onwards | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Modules Numerical Mathematics 1, 2 or comparable knowledge | | |
| Course aims | Knowledge of the concept of wavelets and their analysis; application, development and evaluation of numeric methods on the basis of wavelets. | | |
| Contents of module | Introduction into time-frequency analysis, Gabor transform;<br>Spline wavelets, Daubechies wavelets;<br>Multivariate wavelets and pre-wavelets, shift-invariant spaces;<br>Filter banks. | | |
| Form(s) of instruction | Lecture: 4 h per week, Seminar: 2 h per week | | |
| Total workload in hours | 330 | | |
| | consisting of:<br>A courses | Lecture | Seminar |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 60 h | |
| | B autonomous work in the module | 150 h preparation and elaboration of the seminar presentation | |
| | C module examination | 30 h preparation and examination | |
| Module-component examination | Written or oral examination, presentation, elaboration make in each case up 50%, 30%, 20% of the grade. | | |
| Credit points | 11 CP | | |
| Frequency,<br>duration in semesters | Every other summer semester,<br>1 semester | | |
| Intake capacity | 15 | | |
| Language of instruction | German or English | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Financial Mathematics** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-FM** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 2nd or 4th semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Stochastic Theory 3 | | |
| Course aims | The students should know the most important terms and models of financial mathematics and their mathematical fundamentals: Black-Scholes markets in steady time and Ito integral. Freedom of arbitrage and completeness of steady market models. Simple interest rate structure and credit risk models. Evaluation of derivatives in these models. | | |
| Contents of module | Central contents of financial engineering and financial mathematics. Black-Scholes formula, uni-factor interest rate models, as Vasicek and CIR-model and credit risk models as the Merton model and Cox processes. Risk measures. Evaluation of European and American options. Exotic options, interest rate derivatives and credit default swaps. As mathematical fundamentals, the Ito integral, Girsanow transform and risk theory are scheduled. | | |
| Form(s) of instruction | Lecture: 3 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 240 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 45 h | 30 h |
| | Ab preparation / follow-up work | 70 h | 65 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 8 CP | | |
| Frequency,<br>duration in semesters | Every summer semester,<br>1 semester | | |
| Intake capacity | 200 | | |
| Language of instruction | German | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Mass and Integration Theory** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-MuI** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 1st or 3rd semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Modules Analysis 1, 2 or comparable knowledge | | |
| Course aims | The students should have knowledge of the fundamental terms and propositions of measure and integral theory and shall be prepared to the application of these terms, especially in stochastic theory and financial mathematics. | | |
| Contents of module | Family of sets; measures and their elemental features; continuation of measures; measurable functions; image measures; the measure integral and its elemental features; convergence theorems for integrals; product measures; Fubini's theorem; measures with densities, Radon-Nikodym theorem | | |
| Form(s) of instruction | Lecture: 2 h per week, Tutorial: 1 h per week | | |
| Total workload in hours | 180 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 30 h | 15 h |
| | Ab preparation / follow-up work | 60 h | 60 h |
| | B autonomous work in the module | | |
| | C module examination | 15 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 6 CP | | |
| Frequency,<br>duration in semesters | Every winter semester,<br>1 semester | | |
| Intake capacity | 200 | | |
| Language of instruction | German | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Linear Models with R: Regression and Analysis of Variance** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-R3** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 2nd semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Modules Fundamentals of Data Analysis with R and Statistics and Simulations with R or comparable knowledge | | |
| Course aims | The students learn an analysis of real data through linear models with the "open-source" software R and should<br>• be able to command linear regression,<br>• know methods of construction, transformation and diagnosis of regression models,<br>• be able to carry out inferential statistics (estimation together with confidence and prognosis together with tolerance intervals as well as tests of linear hypotheses),<br>• be able to implement a uni- and multi-factorial analysis of variances. | | |
| Contents of module | • Formulation of simple and multiple linear regression models (together with interactions between co-variables as wells as polynomial regression) in R<br>• Graphic and quantitative diagnostic residual analysis, coordinate transformations, methods of model construction<br>• Estimation and prognosis values together with confidence and tolerance intervals, tests of general linear hypotheses<br>• Uni- and multi-factorial analysis of variances, multiple comparisons | | |
| Form(s) of instruction | Lecture: 2 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 180 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 30 h | 30 h |
| | Ab preparation / follow-up work | 30 h | 60 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: either examination or project with report and presentation (depending on decision of module coordinator). | | |
| Credit points | 6 CP | | |
| Frequency,<br>duration in semesters | Every summer semester,<br>1 semester | | |
| Intake capacity | 10 | | |
| Language of instruction | German (by request in English) | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Selected statistic Methods with R** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-R4** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 3rd semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Linear Models with R: Regression and Analysis of Variance | | |
| Course aims | The students learn about selected statistical methods and their implementation as well as application in the "open-source" software R. | | |
| Contents of module | Selected topics as<br>• durability analysis (censored data, estimation in parametric durability distribution models, non-parametric estimation according to Kaplan-Meier, regression with censored data in the Cox Proportional Hazard Model)<br>• generalised linear models as for example logistic and Poisson regression model<br>• non-parametric curve estimation, e.g. through core estimators and nearest neighbour estimators<br>• non-linear regression | | |
| Form(s) of instruction | Lecture: 2 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 180 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 30 h | 30 h |
| | Ab preparation / follow-up work | 30 h | 60 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h (either examination preparation and examination or project with report and presentation) | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: either examination or project with report and presentation (depending on decision of module coordinator). | | |
| Credit points | 6 CP | | |
| Frequency,<br>duration in semesters | Every winter semester,<br>1 semester | | |
| Intake capacity | 10 | | |
| Language of instruction | German (by request in English) | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Probability and Statistics 3** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-Sto3** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 1st or 3rd semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Modules Stochastic Theory 1 – 2 or comparable knowledge | | |
| Course aims | An extensive and more profound knowledge of and skills in central parts of modern mathematical stochastic theory as a preparation for scientific work in this area and the implementation of its terms and methods into practice | | |
| Contents of module | Central theories of mathematical stochastic theory as<br>• conditional expectations and conditional probability distributions<br>• martingale theory<br>• asymptotic methods | | |
| Form(s) of instruction | Lecture: 4 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 270 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 75 h | 75 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 9 CP | | |
| Frequency,<br>duration in semesters | Every winter semester,<br>1 semester | | |
| Intake capacity | 200 | | |
| Language of instruction | German | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Probability and Statistics 4** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-Sto4** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 2nd or 4th semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Stochastic Theory 3, Measure and Integral Theory | | |
| Course aims | An extensive and more profound knowledge of and skills in the theory of stochastic processes, especially with regard to their role in mathematic modelling and their applications in statistics. | | |
| Contents of module | Theory of stochastic processes and their applications as<br>• Brownian motion<br>• Poisson processes<br>• partial sum processes<br>• empirical processes<br>• asymptotics of stochastic processes<br>• theorems of the limits of a function in statistics | | |
| Form(s) of instruction | Lecture: 4 h per week, Tutorial: 2 h per week | | |
| Total workload in hours | 270 | | |
| | consisting of:<br>A courses | Lecture | Tutorial |
| | Aa contact hours | 60 h | 30 h |
| | Ab preparation / follow-up work | 75 h | 75 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | |
| Credit points | 9 CP | | |
| Frequency,<br>duration in semesters | Every summer semester,<br>1 semester | | |
| Intake capacity | 200 | | |
| Language of instruction | German | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Advanced Module: Financial Mathematics** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-FMV** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 2nd and 3rd semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Stochastic Theory 3 | | |
| Course aims | The students should know the most important terms and methods of risk management and their mathematical fundamentals. Moreover, they should gain a more profound knowledge of and skills in selected areas of financial mathematics that enable them to successfully elaborate a topic of a master's dissertation. | | |
| Contents of module | Selected areas of financial mathematics as<br>• risk theory<br>• risk measures<br>• market-, credit- and operational risk models<br>• allocation- and performance measures<br>• risk management of special products and derivatives<br>• modern portfolio theory<br>• exotic options<br>• asset value models<br>• multivariate models<br>• steady credit risk models<br>• portfolio models<br>• structured products<br>• advanced risk theory<br>• risk models for operational-, credit- and market risks<br>• infinite-dimensional market models | | |
| Form(s) of instruction | 2nd sem.: Lecture: 3h per week, Tutorial: 1h per week,<br>3rd sem.: Lecture: 2 h per week | | |
| Total workload in hours | 270 | | |
| | consisting of:<br>A courses | Lecture<br>2nd sem. | 3rd sem. | Tutorial<br>(2nd sem.) |
| | Aa contact hours | 45 h | 30 h | 15 h |
| | Ab preparation / follow-up work | 54 h | 36 h | 60 h |
| | B autonomous work in the module | | | |
| | C module examination | 30 h preparation and examination | | |
| Module examination | Prerequisite: regular and successful participation in the tutorials.<br>Examination: written or oral examination. | | | |
| Credit points | 9 CP | | | |
| Frequency,<br>duration in semesters | At least every two years, starts in summer semester,<br>2 semesters | | | |
| Intake capacity | 200 | | | |
| Language of instruction | German | | | |
| Date | see course catalogue | | | |
| Reading list | see notice board | | | |

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| **Module description** | **Advanced Module: Probability and Statistics** | | |
|---|---|---|---|
| **Module code** | **07-M/MA-StoV** | | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | | |
| Applies to degree courses / semesters | MSc Mathematics / 2nd and 3rd semester | | |
| Module coordinator | Cf. German Version | | |
| Advice on module | see notice board | | |
| Prerequisites | Stochastic Theory 3 and Measure and Integral Theory | | |
| Course aims | The students should acquire a more profound knowledge of and skills in selected areas of stochastic theory. | | |
| Contents of module | Selected areas of stochastic theory as<br>• empirical processes<br>• time series<br>• re-sampling methods<br>• stochastic analysis<br>• statistics of stochastic processes<br>• large deviations<br>• robust statistics<br>• infinite-dimensional processes<br>• measure-valued diffusions<br>• Dirichlet forms<br>• risk theory<br>• stochastic differential equations<br>• stochastic solutions of partial differential equations | | |
| Form(s) of instruction | 2nd sem.: Lecture: 2 h per week<br>3rd sem.: Lecture: 2 h per week | | |
| Total workload in hours | 180 | | |
| | consisting of:<br>A courses | Lecture<br>2nd sem. | 3rd sem. |
| | Aa contact hours | 30 h | 30 h |
| | Ab preparation / follow-up work | 45 h | 45 h |
| | B autonomous work in the module | | |
| | C module examination | 30 h preparation and examination | |
| Module examination | Written or oral examination | | |
| Credit points | 6 CP | | |
| Frequency,<br>duration in semesters | At least every two years, starts in summer semester,<br>2 semesters | | |
| Intake capacity | 200 | | |
| Language of instruction | German | | |
| Date | see course catalogue | | |
| Reading list | see notice board | | |

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| **Module description** | **Seminar** | |
|---|---|---|
| **Module code** | **07-M/Ma-Sem** | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | |
| Applies to degree courses / semesters | MSc Mathematics / from 2nd semester onwards | |
| Module coordinator | Cf. German Version | |
| Advice on module | see notice board | |
| Prerequisites | Depending on technical orientation. | |
| Course aims | The students should learn in this module<br>• to become acquainted with advanced scientific texts<br>• to discover shortcomings (lacks of evidence, etc.) and, preferably, to correct them<br>• to present coherently and accurately their content in front of an audience.<br>Furthermore, an introduction to the field of the subsequent dissertation can take place. | |
| Contents of module | Scientific texts about various topics or a group of topics. | |
| Form(s) of instruction | Seminar: 2 h per week | |
| Total workload in hours | 180 | |
| | consisting of:<br>A courses | Seminar |
| | Aa contact hours | 30 h |
| | Ab preparation / follow-up work | 60 h |
| | B autonomous work in the module | 90 h preparation and follow-up work on presentation |
| | C module examination | |
| Module-component examination | Form: presentation and poss. elaboration | |
| Credit points | 6 CP | |
| Frequency,<br>duration in semesters | Every semester,<br>1 semester | |
| Intake capacity | 15 | |
| Language of instruction | German / English | |
| Date | see course catalogue | |
| Reading list | see notice board | |

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| **Module description** | **Master Thesis** | |
|---|---|---|
| **Module code** | **07-M/MA-Thes** | |
| Faculty / Subject / Department | Faculty 07 / Mathematics / Department of Mathematics | |
| Applies to degree courses / semesters | MSc Mathematics / 4th semester | |
| Module coordinator | Cf. German Version | |
| Advice on module | see notice board | |
| Prerequisites | Special lecture and seminar or reading course in the field of the thesis. | |
| Course aims | By working autonomously and scientifically, students should compile their master's dissertation. As a general rule, mathematic results are depicted completely and coherently on the basis of a sample taken from the literature at hand. | |
| Contents of module | Study of the relevant literature, writing of the dissertation. Advice through supervisor. | |
| Form(s) of instruction | Seminar 2h/week | |
| Total workload in hours | 900 | |
| | consisting of:<br>A courses | Dissertation |
| | Aa contact hours | 30 h: talks with advisor, poss. presentation (candidate seminar) |
| | Ab preparation / follow-up work | |
| | B autonomous work in the module | 870 h: work on dissertation |
| | C module examination | |
| Module-component examination | (Assessment of the dissertation.) | |
| Credit points | 30 CP | |
| Frequency,<br>duration in semesters | Every semester,<br>1 semester | |
| Intake capacity | | |
| Language of instruction | German | |
| Date | see course catalogue | |
| Reading list | see notice board | |