Georg-August-Universität
Göttingen

Modulverzeichnis

Doctoral Degree Programme [Promotionsstudiengang] "Mathematical Sciences" - referring to: Promotionsordnung der mathematisch-naturwissenschaftlichen Promotionsschule der Georg-August-Universität Göttingen - Georg-August University School of Science (GAUSS) - (RerNatO) (Amtliche Mitteilungen I 21/2012 p. 1176, last revised through Amtliche Mitteilungen I 54/2017 p. 1456)

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Georg-August-Universität Göttingen **Module P.Mat.7101: Scientific colloquia and seminars**	3 C 2 WLH

Learning outcome, core skills: **Learning outcomes:** In this module students learn methods, concepts, theories and applications in mathematical research with particular focus on: • scientific collaboration in a field of research; • workup of scientific presentations attended at a mathematical symposium. **Core skills:** After having successfully completed the module students will be able to • discuss current research within the frame of scientific, research oriented meetings or courses; • present research results in mathematics to an academic audience.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Seminar	2 WLH

Examination: Presentation (appr. 60 minutes) with discussion	

Examination requirements: Presentation of complex mathematical topics in current research.	

Admission requirements: n/a	**Recommended previous knowledge:** n/a
Language: English, German	**Person responsible for module:** Programme coordinator (Dean of Studies Mathematics)
Course frequency: each semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations:
Permitted are:

- seminars (M.Mat.48**);
- 'Oberseminare' (M.Mat.49**);
- symposia, colloquia, block courses etc.

Georg-August-Universität Göttingen **Module P.Mat.7102: Research activities at scientific colloquia and seminars**	3 C 2 WLH

Learning outcome, core skills: **Learning outcomes:** In this module students learn methods, concepts, theories and applications in mathematical research with particular focus on: • workup of own research results for the purpose of a presentation in a seminar or at a symposium. • participation in symposia on mathematical research featuring external audiences; • rework scientific presentations attended at a mathematical symposium. **Core skills:** After having successfully completed the module students will be able to • discuss current research within the frame of scientific, research oriented meetings or courses; • present own research results in mathematics to external audiences.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Symposia	2 WLH

Examination: Presentation (appr. 30 minutes) with discussion	

Examination requirements: Presentation of own research results.	

Admission requirements: n/a	**Recommended previous knowledge:** n/a
Language: English, German	**Person responsible for module:** Programme coordinator (Dean of Studies Mathematics)
Course frequency: each semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations:
Permitted are:

- Symposia, colloquia, block courses etc. with extermal audiences;
- alternatively, seminars (M.Mat.48**) or 'Oberseminare' (M.Mat.49**).

Georg-August-Universität Göttingen **Module P.Mat.7201: Advanced studies in a field of research I**	6 C 4 WLH

Learning outcome, core skills: **Learning outcomes:** In this module students learn methods, concepts, theories and applications in mathematical research with particular focus on: • deepening of knowledge in their field of specialisation; • knowledge of methodical and thematic structure of their field of research. **Core skills:** After having successfully completed the module students will be able to • apply methods and techniques typical in their field of reasearch; • solve problems in their field of research; • develop stategies for solving problems typical in the field of research and present the solutions found.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Seminar or lecture course	2 WLH

Examination: Oral examination (appr. 20 minutes) or presentation (appr. 75 minutes)	

Examination requirements: Proof of advanced knowledge in the area of the doctoral project.	

Admission requirements: n/a	**Recommended previous knowledge:** n/a
Language: English, German	**Person responsible for module:** Programme coordinator (Dean of Studies Mathematics)
Course frequency: each semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations:
Permitted are:

- seminars (M.Mat.48**);
- 'Oberseminare' (M.Mat.49**);
- lecture course with exercises where applicable:
  - M.Mat.****
  - "Introduction to ..." ("Einführung in ...")

    - "Advances in ..." ("Vertiefung in ...")
- summer schools, winter schools and comparable block courses.

Georg-August-Universität Göttingen **Module P.Mat.7202: Advanced studies in a field of research II**	3 C 2 WLH

Learning outcome, core skills: **Learning outcomes:** In this module students learn methods, concepts, theories and applications in mathematical research with particular focus on: • deepening of knowledge in their field of specialisation; • knowledge of methodical and thematic structure of their field of research. **Core skills:** After having successfully completed the module students will be able to • apply methods and techniques typical in their field of reasearch; • solve problems in their field of research; • develop stategies for solving problems typical in the field of research and present the solutions found.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Seminar or lecture course	2 WLH

Examination: Oral examination (appr. 20 minutes) or presentation (appr. 75 minutes)	

Examination requirements: Proof of advanced knowledge in the area of the doctoral project.	

Admission requirements: n/a	**Recommended previous knowledge:** n/a
Language: English, German	**Person responsible for module:** Programme coordinator (Dean of Studies Mathematics)
Course frequency: each semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations:
Permitted are:

- seminars (M.Mat.48**);
- 'Oberseminare' (M.Mat.49**);
- lecture course with exercises where applicable:
  - M.Mat.****
  - "Introduction to ..." ("Einführung in ...")

    - "Advances in ..." ("Vertiefung in ...")
- summer schools, winter schools and comparable block courses.

Georg-August-Universität Göttingen **Module P.Mat.7203: Complementary studies**	3 C 4 WLH

Learning outcome, core skills: **Learning outcomes:** In this module students learn methods, concepts, theories and applications in mathematical research with particular focus on: • expansion of knowledge in their field of specialisation; • advanced knowledge of methodical and thematic structure of their field of research; alternatively, • supervised designing of a course (lecture course, seminar or exercise class); • supervision of students in seminars, exercise classes etc. as well as of thesis work and projects. **Core skills:** After having successfully completed the module students will be able to • apply a rich repertoire of methoed in their field of specialisation; • consider results of their field of research in a larger context; alternatively, • critically reflect the own teaching; • expand their reflection of the scientific background.	**Workload:** Attendance time: 56 h Self-study time: 34 h

Course: Seminar or lecture course	2 WLH

Examination: Oral examination (appr. 20 minutes) or presentation (appr. 75 minutes)	

Examination requirements: Proof of complementary knowledge in the field of specialisation.	

Admission requirements: n/a	**Recommended previous knowledge:** n/a
Language: English, German	**Person responsible for module:** Programme coordinator (Dean of Studies Mathematics)
Course frequency: each semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations:

Permitted are:

- seminars (M.Mat.48**);
- 'Oberseminare' (M.Mat.49**);
- lecture course with exercises where applicable:
  - M.Mat.****
  - "Introduction to ..." ("Einführung in ...")
  - "Advances in ..." ("Vertiefung in ...")
- summer schools, winter schools and comparable block courses.

alternatively,

- supervision of students in seminars, exercise classes etc. as well as of thesis work and projects.

Georg-August-Universität Göttingen **Module P.Mat.7301: Accompanying seminar: Introduction to reseach**	3 C 2 WLH

Learning outcome, core skills: **Learning outcomes:** In this module students learn methods, concepts, theories and applications in mathematical research with particular focus on: • overview on literature relevant in their field of specialisation. **Core skills:** After having successfully completed the module students will be able to • apply a rich repertoire of methods in their field of specialisation; • independent study on recent research results on the basis of recent research literature.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Seminar	2 WLH

Examination: Presentation (appr. 75 minutes)	

Examination requirements: Proof of overview on literature relevant in a field of research.	

Admission requirements: n/a	**Recommended previous knowledge:** n/a
Language: English, German	**Person responsible for module:** Programme coordinator (Dean of Studies Mathematics)
Course frequency: each semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations:
Permitted are:

- seminars (M.Mat.48**);
- 'Oberseminare' (M.Mat.49**);
- summer schools, winter schools and comparable block courses.

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Georg-August-Universität Göttingen **Module P.Mat.7302: Accompanying seminar: Scientific analysis of research questions**	3 C 2 WLH

Learning outcome, core skills: **Learning outcomes:** In this module students learn methods, concepts, theories and applications in mathematical research with particular focus on: • overview on methods relevant to solving problems in mathematical research. **Core skills:** After having successfully completed the module students will be able to • independently formulate mathematical problems; • describe appropriate solution strategies; • communicate solution ideas and obstacles.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Seminar	2 WLH

Examination: Presentation (appr. 75 minutes)	

Examination requirements: Proof of overview on methods relevant in a field of research.	

Admission requirements: n/a	**Recommended previous knowledge:** n/a
Language: English, German	**Person responsible for module:** Programme coordinator (Dean of Studies Mathematics)
Course frequency: each semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations:
Permitted are:

- seminars (M.Mat.48**);
- 'Oberseminare' (M.Mat.49**);
- summer schools, winter schools and comparable block courses.

Georg-August-Universität Göttingen **Module P.Mat.7303: Accompanying seminar: Documentation of mathematical issues**	3 C 2 WLH

Learning outcome, core skills: **Learning outcomes:** In this module students learn methods, concepts, theories and applications in mathematical research with particular focus on: • development of a personalised style of scientific writing following the guidelines of good scientific practice and the recognised standards in mathematics. **Core skills:** After having successfully completed the module students will be able to • independently formulate mathematical problems; • describe appropriate solution strategies; • communicate solution ideas and obstacles; • master the established rules of good scientific practice.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Seminar	2 WLH

Examination: Presentation (appr. 75 minutes)	

Examination requirements: Ability of documentation of mathematical issues.	

Admission requirements: n/a	**Recommended previous knowledge:** n/a
Language: English, German	**Person responsible for module:** Programme coordinator (Dean of Studies Mathematics)
Course frequency: each semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations:
Permitted are:

- seminars (M.Mat.48**);
- 'Oberseminare' (M.Mat.49**);
- summer schools, winter schools and comparable block courses.

Georg-August-Universität Göttingen **Module P.Mat.7901: Key competencies in university teaching**	3 C 2 WLH

Learning outcome, core skills: **Learning outcomes:** Successful completion of this module enables students to acquire skill in university teaching. This includes: • ability to communicate mathematical content to students in the first year of their undergraduate studies; • ability to deal with heterogeneous exercise classes; • use of appropriate teaching methods and visualization techniques; • confident appearance. **Core skills:** After having successfully completed the module students will have acquired: • rhetoric and presentation skills; • team competence including constructive way of dealing with conflicts and capability to motivate; • time management skills; • intercultural communication skills, where applicable.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Exercise class	2 WLH

Examination: Giving a lesson in an exercise classe (appr. 90 minutes)	

Examination requirements: Ability to apply basic key competencies in university teaching.	

Admission requirements: n/a	**Recommended previous knowledge:** n/a
Language: English, German	**Person responsible for module:** Programme coordinator (Dean of Studies Mathematics)
Course frequency: each semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations:
This module can be replaced by any other key competency module offered by the teaching unit mathematics or by any cross-faculty key competency module. Alternatively, supervision of students in exercise classes can be acknowledged.