**Modules for Mathematics**

**Mastermodule**

mat505 - C* Algebras and Operator Theory

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction** German, English

**Duration (semesters)** 1 Semester

**Module frequency**

**Module capacity** unlimited

**Modullevel** ---

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

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**Total time of attendance for the module** 84 h
mat510 - Fourier Analysis

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction** German, English

**Duration (semesters)** 1 Semester

**Module frequency**

**Module capacity** unlimited

**Modullevel** ---

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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mat515 - Functional Analysis II

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Languages of instruction** | German, English

**Duration (semesters)** | 1 Semester

**Module frequency**

**Module capacity** | unlimited

**Modulart** | je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

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**Total time of attendance for the module** | 84 h
mat520 - Special Topics in Functional Analysis

Module label: Special Topics in Functional Analysis

Module code: mat520

Credit points: 6.0 KP

Workload: 180 h

Used in course of study: Master Mathematik > Mastermodule

Contact person:
- Module responsibility
  - Daniel Grieser
  - Boris Vertman
  - Hannes Uecker

Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction: German, English

Duration (semesters): 1 Semester

Module frequency

Module capacity: unlimited

Module level: ---

Moduleart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

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Total time of attendance for the module: 56 h

Lecture: 2.00 SWS
Exercises: 2.00 SWS
mat525 - Non-Linear Functional Analysis

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**Contact person**
- Daniel Grieser
- Boris Vertman
- Hannes Uecker

**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader’s advisory**

**Links**

**Languages of instruction** German, English

**Duration (semesters)** 1 Semester

**Module frequency**

**Module capacity** unlimited

**Modullevel** ---

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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mat50 - Topology

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**Contact person**
- Daniel Grieser
- Boris Vertman
- Hannes Uecker

**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction**
- German, English

**Duration (semesters)**
- 1 Semester

**Module frequency**

**Module capacity**
- unlimited

**Modullevel**
- ---

**Modultur**
- je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

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**Total time of attendance for the module**

- 56 h
## mat535 - Global Analysis

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### Contact person

- Module responsibility
  - Daniel Grieser
  - Boris Vertman

### Entry requirements

#### Skills to be acquired in this module

#### Module contents

#### Reader's advisory

### Links

#### Languages of instruction
  - German, English

#### Duration (semesters)
  - 1 Semester

#### Module frequency
  - unlimited

#### Modullevel
  - ---

#### Modulart
  - je nach Studiengang Pflicht oder Wahlpflicht

### Lern-/Lehrform / Type of program

#### Vorkenntnisse / Previous knowledge

#### Examination

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### Total time of attendance for the module
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### mat540 - Differential Geometry

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction**

**German, English**

**Duration (semesters)**

**1 Semester**

**Module frequency**

**unlimited**

**Module level**

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**Moduleart**

je nach Studiengang Pflicht oder Wahlpflicht

### Lern-/Lehrform / Type of program

**Vorkenntnisse / Previous knowledge**

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**Total time of attendance for the module**

84 h
### mat545 - Complex Analysis II

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# mat550 - Spectral Theory of Differential Operators

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## Entry requirements

## Skills to be acquired in this module

## Module contents

## Reader's advisory

## Languages of instruction
- German, English

## Duration (semesters)
- 1 Semester

## Module capacity
- unlimited

## Modular level
- ---

## Lern-/Lehrform / Type of program

## Vorkenntnisse / Previous knowledge

## Examination

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## Total time of attendance for the module
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mat555 - Partial Differential Equations I

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Entry requirements
Skills to be acquired in this module
Module contents
Reader's advisory
Links
Languages of instruction German, English
Duration (semesters) 1 Semester
Module frequency
Module capacity unlimited
Modullevel ---
Modulart je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program
Vorkenntnisse / Previous knowledge

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Total time of attendance for the module 84 h
**mat560 - Partial Differential Equations II**

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<td>• Boris Vertman</td>
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<td>• Hannes Uecker</td>
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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction** German, English

**Duration (semesters)** 1 Semester

**Module frequency**

**Module capacity** unlimited

**Modul level** ---

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

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**Final exam of module**

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**Total time of attendance for the module** 84 h
mat565 - Non-Linear Partial Differential Equations

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Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction German, English

Duration (semesters) 1 Semester

Module frequency

Module capacity unlimited

Modullevel ---

Modulart je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination Time of examination Type of examination

Final exam of module KL

Course type Comment SWS Frequency Workload attendance
Lecture 4.00 -- 56 h
Exercises 2.00 -- 28 h

Total time of attendance for the module 84 h
mat570 - Dynamical Systems

Module label: Dynamical Systems
Module code: mat570
Credit points: 6.0 KP
Workload: 180 h

Used in course of study: Master Mathematik > Mastermodule

Contact person: Daniel Grieser, Boris Vertman, Hannes Uecker

Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Languages of instruction: German, English

Duration (semesters): 1 Semester

Module frequency

Module capacity: unlimited

Modullevel: ---

Modulart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination

Time of examination

Type of examination

Final exam of module

KL

Course type

Comment

SWS

Frequency

Workload attendance

Lecture

3.00

--

42 h

Exercises

1.00

--

14 h

Total time of attendance for the module

56 h
mat575 - Modelling with Partial Differential Equations

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**Entry requirements**

Skills to be acquired in this module

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction** German, English

**Duration (semesters)** 1 Semester

**Module frequency**

**Module capacity** unlimited

**Modullevel** ---

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

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**Course type** Comment SWS Frequency Workload attendance

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**Total time of attendance for the module** 56 h
### mat580 - Inverse Problems I

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#### Entry requirements

#### Skills to be acquired in this module

#### Module contents

#### Reader's advisory

#### Links

#### Languages of instruction

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#### Vorkenntnisse / Previous knowledge

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#### Total time of attendance for the module

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### mat585 - Inverse Problems II

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17 / 77
### mat590 - Mathematical Models of Computer Tomography

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mat595 - Numerical Methods for Partial Differential Equations

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<td>• Alexey Chernov</td>
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Entry requirements
Skills to be acquired in this module
Module contents
Reader's advisory
Links
Languages of instruction: German, English
Duration (semesters): 1 Semester
Module frequency: 
Module capacity: unlimited
Modullevel: ---
Modulart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination
Time of examination
Type of examination

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Course type
Comment
SWS
Frequency
Workload attendance

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Total time of attendance for the module: 84 h
**mat597 - Numerical Methods for Partial Differential Equations with Uncertainties**

**Module label**
Numerical Methods for Partial Differential Equations with Uncertainties

**Module code**
mat597

**Credit points**
6.0 KP

**Workload**
180 h

**Used in course of study**
- Master Mathematik > Mastermodule

**Contact person**
Module responsibility

- Alexey Chernov

**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction**
German, English

**Duration (semesters)**
1 Semester

**Module frequency**

**Module capacity**
unlimited

**Modullevel**
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**Modulart**
je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

**Final exam of module**

**Type of examination**

**Time of examination**

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**Total time of attendance for the module**

56 h
## mat600 - Parameter Identification in Partial Differential Equations

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### mat605 - Seminar in Analysis

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction** | German, English  
**Duration (semesters)** | 1 Semester  

**Module frequency**

**Module capacity** | 14  
**Modullevel** | ---  
**Modulart** | je nach Studiengang Pflicht oder Wahlpflicht  

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**  
**Time of examination**  
**Type of examination**  
**Final exam of module** | SA  

**Course type** | Seminar  
**SWS** | 2.00  
**Frequency** | --  
**Workload attendance** | 28 h
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mat615 - Seminar in Numerical Analysis

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction** German, English

**Duration (semesters)** 1 Semester

**Module frequency**

**Module capacity** unlimited

**Modullevel** ---

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

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**Course type** Seminar

**SWS** 2.00

**Frequency** --

**Workload attendance** 28 h
mat705 - Algebraic Number Theory

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Entry requirements
Skills to be acquired in this module

Module contents

Reader's advisory

Links
Languages of instruction  | German, English
Duration (semesters)      | 2 Semester
Module frequency          | unlimited
 Modulelevel              | ---
Modulart                  | je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program
Vorkenntnisse / Previous knowledge

Examination | Time of examination | Type of examination
---          | ---                 | ---

Final exam of module | KL
Course type | Comment | SWS | Frequency | Workload attendance |
---          | ---     | --- | ---       | ---                 |
Lecture     | 3.00    | --  | --        | 42 h                |
Exercises   | 1.00    | --  | --        | 14 h                |
Seminar     | 2.00    | --  | --        | 28 h                |

Total time of attendance for the module | 84 h
mat710 - Algorithmic Number Theory

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**Contact person**

- Module responsibility
  - Florian Heß
  - Andreas Stein

**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction**

German, English

**Duration (semesters)**

1 Semester

**Module frequency**

unlimited

**Modullevel**

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**Modulart**

je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

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**Total time of attendance for the module**

56 h
mat715 - Algebraic Curves and Functions

Module label: Algebraic Curves and Functions
Module code: mat715
Credit points: 6.0 KP
Workload: 180 h

Used in course of study:
- Master Mathematik > Mastermodule

Contact person
Module responsibility
- Florian Heß
- Andreas Stein

Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction: German, English
Duration (semesters): 1 Semester
Module frequency
Module capacity: unlimited
Modullevel: ---
Modulart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination
Time of examination
Type of examination

Final exam of module

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Total time of attendance for the module: 56 h
mat720 - Elliptic Curves

Module label: Elliptic Curves
Module code: mat720
Credit points: 9.0 KP
Workload: 270 h
Used in course of study: Master Mathematik > Mastermodule
Contact person: Module responsibility
  - Florian Heß
  - Andreas Stein

Entry requirements
Skills to be acquired in this module
Module contents
Reader's advisory
Links
Languages of instruction: German, English
Duration (semesters): 2 Semester
Module frequency: unlimited
Modulelevel: ---
Modulart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program
Vorkenntnisse / Previous knowledge
Examination: Time of examination: Type of examination

Final exam of module
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Total time of attendance for the module: 84 h
mat725 - Arithmetic Duality

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Contact person

Module responsibility
- Florian Heß
- Andreas Stein

Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction | German, English |
Duration (semesters)     | 1 Semester     |
Module frequency         | unlimited       |
Modullevel               | ---             |
Modular                     | je nach Studiengang Pflicht oder Wahlpflicht |

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

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Final exam of module

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction** German, English

**Duration (semesters)** 1 Semester

**Module frequency**

**Module capacity** unlimited

**Modulelevel** ---

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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**mat735 - Complex Multiplication**

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

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**Modular**

je nach Studiengang Pflicht oder Wahlpflicht

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**mat740 - Mathematical Cryptology**

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#### Entry requirements

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

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#### Examination

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**Course type** | **Comment** | **SWS** | **Frequency** | **Workload attendance** |
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**Total time of attendance for the module**

56 h
### mat750 - Commutative Algebra

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction** | German, English |
---|---|
**Duration (semesters)** | 1 Semester |
**Module frequency** | unlimited |
**Module capacity** | unlimited |
**Modullevel** | --- |
**Modulart** | je nach Studiengang Pflicht oder Wahlpflicht |

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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**Course type** | **Comment** | **SWS** | **Frequency** | **Workload attendance** |
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**Total time of attendance for the module** | 56 h |
mat755 - Topics in Algebraic Geometry

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<td></td>
<td>• Florian Heß</td>
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<td></td>
<td>• Andreas Stein</td>
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mat765 - Special Topics in Number Theory

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<td>• Florian Heß</td>
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Entry requirements
Skills to be acquired in this module
Module contents
Reader's advisory
Links
Languages of instruction: German, English
Duration (semesters): 1 Semester
Module frequency: unlimited
Modullevel: ---
Modulart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program
Vorkenntnisse / Previous knowledge

Examination | Time of examination | Type of examination
---|---|---

Final exam of module | KL
---|---
Course type | Comment | SWS | Frequency | Workload attendance
---|---|---|---|---
Lecture  |   | 3.00 | -- | 42 h
Exercises | | 1.00 | -- | 14 h

Total time of attendance for the module | 56 h
mat765 - Computer Algebra

Module label: Computer Algebra
Module code: mat765
Credit points: 6.0 KP
Workload: 180 h
Used in course of study: Master Mathematik > Mastermodule

Contact person
Module responsibility
- Florian Heß
- Andreas Stein

Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links
Languages of instruction: German, English
Duration (semesters): 1 Semester

Duration (semesters)
Module frequency
Module capacity: unlimited
Modullevel: ---
Modulart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program
Vorkenntnisse / Previous knowledge

Examination
Time of examination
Type of examination

Final exam of module
KL

Course type
Comment
SWS
Frequency
Workload attendance
Lecture
3.00
--
42 h
Exercises
1.00
--
14 h

Total time of attendance for the module
56 h
mat770 - Seminar Algebra and Number Theory

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**Contact person**

- Module responsibility
  - Andreas Stein
  - Florian Heß

**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction**

- German
- English

**Duration (semesters)**

- 1 Semester

**Module frequency**

**Module capacity**

- unlimited

**Modullevel**

**Modulart**

- je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

**Time of examination**

**Type of examination**

- Final exam of module
  - RE

**Course type**

- Seminar

**SWS**

- 2.00

**Frequency**

- --

**Workload attendance**

- 28 h
### mat775 - Analytic Number Theory

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction**

German, English

**Duration (semesters)**

1 Semester

**Module frequency**

unlimited

**Module level**

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**Modulart**

je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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**Total time of attendance for the module**

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mat805 - Actuarial Mathematics I

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<td></td>
<td>○ Marcus Christiansen</td>
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<td>○ Peter Ruckdeschel</td>
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### Entry requirements

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction** German, English

**Duration (semesters)** 1 Semester

**Module frequency**

**Module capacity** unlimited

**Modulelevel** ---

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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**Total time of attendance for the module** 84 h
mat810 - Quantitative Risk Management

Module label: Quantitative Risk Management
Module code: mat810
Credit points: 9.0 KP
Workload: 270 h
Used in course of study: Master Mathematik > Mastermodule

Contact person:
- Marcus Christiansen
- Angelika May
- Peter Ruckdeschel

Entry requirements:
Skills to be acquired in this module:
Students shall learn about fundamental mathematical concepts of modern risk management in the insurance industry.

Module contents:
Fundamentals of ruin theory, risk measures, modelling of dependent risks, fundamentals of Asset-Liability-Management, performance measures, mathematical and legislative foundations of the Solvency II process, statistical Monte Carlo methods, stochastic internal business models, allocation principles of risk capital.

Reader’s advisory:

Links:
Languages of instruction: English, German
Duration (semesters): 1 Semester
Module frequency: im 2-Jahres-Zyklus
Module capacity: unlimited
Modulelevel: MM (Mastermodul)
Modulart: Wahlpflicht

Lern-/Lehrform / Type of program: lecture + tutorial

Vorkenntnisse / Previous knowledge:

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<td>written or oral exam or solving of exercises</td>
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Total time of attendance for the module: 84 h
mat815 - Decisions under Risk and Uncertainty

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

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**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

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**Total time of attendance for the module**

| Total time of attendance for the module | 56 h |


mat820 - Stochastic Analysis and continuous-time Financial Mathematics

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction** German, English

**Duration (semesters)** 1 Semester

**Module frequency**

**Module capacity** unlimited

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

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**Total time of attendance for the module** 56 h
mat825 - Stochastic Processes and Finance

Module label: Stochastic Processes and Finance
Module code: mat825
Credit points: 9.0 KP
Workload: 270 h
Used in course of study: Master Mathematik > Mastermodule

Contact person
Module responsibility:
- Marcus Christiansen
- Angelika May
- Peter Ruckdeschel

Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction: English, German

Duration (semesters): 1 Semester

Module frequency
Module capacity: unlimited
Modullevel: ---
Modular: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination
Type of examination

Final exam of module

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Total time of attendance for the module: 84 h
mat826 - Statistics of Financial Markets

Module label: Statistics of Financial Markets
Module code: mat826
Credit points: 6.0 KP
Workload: 180 h
Used in course of study: Master Mathematik > Mastermodule

Contact person
Module responsibility
- Marcus Christiansen
- Angelika May
- Peter Ruckdeschel

Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction: German, English
Duration (semesters): 1 Semester

Module frequency
Module capacity: unlimited
Modullevel: ---
Modulart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination
Time of examination
Type of examination

Final exam of module

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Total time of attendance for the module: 56 h
### mat830 - Linear Models / Regression

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction** German, English

**Duration (semesters)** 1 Semester

**Module frequency**

**Module capacity** unlimited

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

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**Total time of attendance for the module** 56 h
mat835 - Generalized Regression

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Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction German, English

Duration (semesters) 1 Semester

Module frequency

Module capacity unlimited

Modullevel ---

Modulart je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination Time of examination Type of examination

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Total time of attendance for the module 56 h
## mat837 - Extreme Value Statistics and Applications

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| Used in course of study | Master Mathematik > Mastermodule  
|              | Master Umweltmodellierung > Mastermodule |
| Contact person| Module responsibility               |
|              | • Marcus Christiansen                   |
|              | • Angelika May                          |
|              | • Peter Ruckdeschel                     |

### Entry requirements

### Skills to be acquired in this module

### Module contents

### Reader's advisory

### Languages of instruction
- German, English

### Duration (semesters)
- 1 Semester

### Module frequency
- unlimited

### Module level
- ---

### Moduleart
- je nach Studiengang Pflicht oder Wahlpflicht

### Lern-/Lehrform / Type of program

### Vorkenntnisse / Previous knowledge

### Examination

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### Course type

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### Total time of attendance for the module
- 56 h
mat839 - Time Series Models resp. State Space Models

Module label: Time Series Models resp. State Space Models
Module code: mat839
Credit points: 6.0 KP
Workload: 180 h
Used in course of study:
- Master Mathematik > Mastermodule
- Master Umweltmodellierung > Mastermodule

Contact person
Module responsibility:
- Marcus Christiansen
- Angelika May
- Peter Ruckdeschel

Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Languages of instruction: German, English
Duration (semesters): 1 Semester

Module frequency
Module capacity: unlimited
Modullevel: ---
Modularart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination
Time of examination
Type of examination

Final exam of module

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Total time of attendance for the module: 56 h
mat840 - Monte Carlo Methods

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Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction | German, English |
Duration (semesters)      | 1 Semester     |

Module frequency

Module capacity | unlimited |

Modullevel

Modulart | je nach Studiengang Pflicht oder Wahlpflicht |

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

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Total time of attendance for the module | 56 h |

Comment

Frequency

Workload attendance
**mat843 - Elements of Multivariate Statistics**

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  - Master Mathematik > Mastermodule  
  - Master Umweltmodellierung > Mastermodule |
| Contact person | Module responsibility  
  - Angelika May  
  - Marcus Christiansen  
  - Peter Ruckdeschel |

**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Languages of instruction** | German, English |

**Duration (semesters)** | 1 Semester |

**Module frequency** | --- |

**Module capacity** | unlimited |

**Modulart** | je nach Studiengang Pflicht oder Wahlpflicht |

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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**Total time of attendance for the module** | 56 h |

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mat845 - Spatial Statistics

Module label: Spatial Statistics
Module code: mat845
Credit points: 6.0 KP
Workload: 180 h

Used in course of study:
- Master Mathematik > Mastermodule

Contact person:
- Module responsibility
  - Marcus Christiansen
  - Angelika May
  - Peter Ruckdeschel

Entry requirements:

Skills to be acquired in this module:

Module contents:

Reader's advisory:

Links:

Languages of instruction: German, English

Duration (semesters): 1 Semester

Module frequency:

Module capacity: unlimited

Moduleart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program:

Vorkenntnisse / Previous knowledge:

Examination:
- Time of examination
- Type of examination

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# mat847 - Elements of Exploratory Data Analysis, Robust Statistics, and Diagnostics

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**Used in course of study**
- Master Mathematik > Mastermodule
- Master Umweltmodellierung > Mastermodule

**Contact person**
- Module responsibility
  - Marcus Christiansen
  - Angelika May
  - Peter Ruckdeschel

**Entry requirements**

**Skills to be acquired in this module**

**Reader's advisory**

**Languages of instruction**
- German, English

**Duration (semesters)**
- 1 Semester

**Module frequency**
- ---

**Module capacity**
- unlimited

**Lern-/Lehrform / Type of program**
- Je nach Studiengang Pflicht oder Wahlpflicht

**Vorkenntnisse / Previous knowledge**

**Final exam of module**

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**Total time of attendance for the module**
- 56 h
mat850 - Asset Liability Management

Module label: Asset Liability Management
Module code: mat850
Credit points: 6.0 KP
Workload: 180 h

Used in course of study: Master Mathematik > Mastermodule

Contact person:
Module responsibility:
  - Marcus Christiansen
  - Angelika May
  - Peter Ruckdeschel

Entry requirements:

Skills to be acquired in this module:

Module contents:

Reader's advisory:

Links:
Languages of instruction: German, English

Duration (semesters): 1 Semester

Module frequency:
Module capacity: unlimited

Modullevel: ---
Modularart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program:

Vorkenntnisse / Previous knowledge:

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### mat855 - Stochastic Finance

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**Total time of attendance for the module**: 56 h
mat857 - Stochastic Models in Finance

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Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction German, English

Duration (semesters) 1 Semester

Module frequency

Module capacity unlimited

Modulart je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

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Total time of attendance for the module 56 h
### mat860 - Advanced Topics in Stochastic Modelling

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#### Entry requirements
- Skills to be acquired in this module
- Module contents
- Reader's advisory
- Links
- Languages of instruction: German, English
- Duration (semesters): 1 Semester
- Module frequency
- Module capacity: unlimited
- Modullevel: ---
- Modulart: je nach Studiengang Pflicht oder Wahlpflicht

#### Lern-/Lehrform / Type of program
- Vorkenntnisse / Previous knowledge
- Examination

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**Total time of attendance for the module**: 56 h
### mat865 - Advanced Topics in Statistics

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#### Contact person

- Marcus Christiansen
- Angelika May
- Peter Ruckdeschel
- Kornelius Rohmeyer

#### Entry requirements

#### Skills to be acquired in this module

#### Reader's advisory

#### Module contents

#### Languages of instruction

- German, English

#### Duration (semesters)

- 1 Semester

#### Module frequency

#### Module capacity

- unlimited

#### Modullevel

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#### Modulart

- je nach Studiengang Pflicht oder Wahlpflicht

#### Lern-/Lehrform / Type of program

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#### Entry requirements

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction**  
German, English

**Duration (semesters)**  
1 Semester

**Module frequency**

**Module capacity**  
unlimited

**Modullevel**  
---

**Modulart**  
je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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**Course type**  
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### mat875 - Seminar in Actuarial Mathematics, Probability and Statistics

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#### Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction German, English

Duration (semesters) 1 Semester

Module frequency

Module capacity unlimited

Moduleart je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

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### mat880 - Seminar in Mathematical Finance

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#### Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction: **German, English**

Duration (semesters): **1 Semester**

#### Module frequency

Module capacity: **unlimited**

**Module level:** ---

**Modulart:** je nach Studiengang Pflicht oder Wahlpflicht

#### Lern-/Lehrform / Type of program

**Vorkenntnisse / Previous knowledge**

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**Course type:** Seminar

**SWS**

2.00

**Frequency**

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**Workload attendance**

28 h
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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction**

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**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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**Course type**

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**pb - Professionalisierung**

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction** German, English

**Duration (semesters)** 1 Semester

**Module frequency** unlimited

**Module capacity** unlimited

**Modullevel** ---

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination** Time of examination Type of examination

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**Total time of attendance for the module** 84 h
mat593 - Inverse Problems II

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Total time of attendance for the module 56 h
mat538 - Singular Analysis

Module label | Singular Analysis
---|---
Module code | mat538
Credit points | 6.0 KP
Workload | 180 h
Used in course of study | Master Mathematik > Mastermodule

Contact person

Module responsibility

- Daniel Grieser
- Boris Vertman

Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction | German, English
---|---
Duration (semesters) | 1 Semester

Module frequency

Module capacity | unlimited

Modullevel | ---

Modulart | je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination | Time of examination | Type of examination
---|---|---

Final exam of module

| Course type | Comment | SWS | Frequency | Workload attendance |
---|---|---|---|---
Lecture | | 3.00 | SuSe or WiSe | 42 h |
Exercises | | 1.00 | SuSe or WiSe | 14 h |

Total time of attendance for the module | 56 h
## mat542 - Complex Geometry

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### Entry requirements

**Skills to be acquired in this module**

### Module contents

### Reader's advisory

### Links

**Languages of instruction**
German, English

**Duration (semesters)**
1 Semester

**Module frequency**
unlimited

**Modullevel**
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**Modulart**
je nach Studiengang Pflicht oder Wahlpflicht

### Lern-/Lehrform / Type of program

**Vorkenntnisse / Previous knowledge**

### Examination

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**Total time of attendance for the module**
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mat543 - Selected Topics in Geometry

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mat579 - Selected Topics in Analysis

Module label
Selected Topics in Analysis

Module code
mat579

Credit points
6.0 KP

Workload
180 h

Used in course of study
- Master Mathematik > Mastermodule

Contact person
Module responsibility
- Daniel Grieser
- Boris Vertman

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction
German, English

Duration (semesters)
1 Semester

Module frequency

Module capacity
unlimited

Modullevel
---

Modulart
je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination
Time of examination
Type of examination

Final exam of module
KL

Course type
Comment
SWS
Frequency
Workload attendance

Lecture

3.00
SuSe or WiSe
42 h

Seminar or exercise

1.00
SuSe or WiSe
14 h

Total time of attendance for the module
56 h
mat599 - Selected Topics in Numerical Analysis

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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Languages of instruction**

**Links**

**Duration (semesters)**

**Module frequency**

**Module capacity**

**Modulelevel**

**Modulart**

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>Time of examination</td>
<td>Type of examination</td>
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**Final exam of module**

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>3.00</td>
<td>SuSe or WiSe</td>
<td>42 h</td>
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<tr>
<td>Seminar or exercise</td>
<td></td>
<td>1.00</td>
<td>SuSe or WiSe</td>
<td>14 h</td>
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**Total time of attendance for the module**

56 h
## mat779 - Selected Topics in Algebra

<table>
<thead>
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<tbody>
<tr>
<td>Module code</td>
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<tr>
<td>Credit points</td>
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<td>Workload</td>
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<td>Master Mathematik &gt; Mastermodule</td>
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<tr>
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<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>- Florian Heß</td>
</tr>
<tr>
<td></td>
<td>- Andreas Stein</td>
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</table>

### Entry requirements

#### Skills to be acquired in this module

#### Module contents

#### Reader's advisory

#### Links

### Languages of instruction

German, English

### Duration (semesters)

1 Semester

### Module frequency

unlimited

### Module capacity

unlimited

### Modulart

je nach Studiengang Pflicht oder Wahlpflicht

### Lern-/Lehrform / Type of program

#### Vorkenntnisse / Previous knowledge

#### Examination

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### Course type

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<td></td>
<td>3.00</td>
<td>SuSe or WiSe</td>
<td>42 h</td>
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<tr>
<td>Seminar or exercise</td>
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### Total time of attendance for the module

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mat806 - Actuarial Mathematics II

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<td>Master Mathematik &gt; Mastermodule</td>
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<tr>
<td>Contact person</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>➢ Marcus Christiansen</td>
</tr>
<tr>
<td></td>
<td>➢ Angelika May</td>
</tr>
<tr>
<td></td>
<td>➢ Peter Ruckdeschel</td>
</tr>
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Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction | German, English

Duration (semesters) | 1 Semester

Module frequency

Module capacity | unlimited

Modullevel | ---

Modulart | je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination

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Total time of attendance for the module | 56 h
mat816 - Quantitative Risk Analysis

Module label: Quantitative Risk Analysis
Module code: mat816
Credit points: 6.0 KP
Workload: 180 h
Used in course of study: Master Mathematik > Mastermodule

Contact person:
- Marcus Christiansen
- Angelika May
- Peter Ruckdeschel

Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Languages of instruction: German, English

Duration (semesters): 1 Semester

Module frequency

Module capacity: unlimited

Modulart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination

Type of examination

Final exam of module

KL

Course type

Comment

SWS

Frequency

Workload attendance

Lecture

3.00

SuSe or WiSe

42 h

Exercises

1.00

SuSe or WiSe

14 h

Total time of attendance for the module

56 h
### mat811 - Quantitative Risk Analysis

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**Used in course of study**
- Master Mathematik > Mastermodule

**Contact person**
- Module responsibility
  - Marcus Christiansen
  - Angelika May
  - Peter Ruckdeschel

**Entry requirements**

**Skills to be acquired in this module**

**Reader's advisory**

**Languages of instruction**
- German, English

**Duration (semesters)**
- 1 Semester

**Module frequency**

**Module capacity**
- unlimited

**Modulart**
- je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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<td>Exercises</td>
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**Total time of attendance for the module**
- 56 h
### Abschlussmodul

**mam - Master’s Thesis Module**

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<tr>
<td></td>
<td>• Alexey Chernov</td>
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<td>• Marcus Christiansen</td>
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<td>• Andreas Stein</td>
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<td>• Hannes Uecker</td>
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<td>• Boris Vertman</td>
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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader’s advisory**

**Links**

**Languages of instruction**

**German, English**

**Duration (semesters)**

1 Semester

**Module frequency**

unlimited

**Modullevel**

---

**Modulart**

je nach Studiengang Pflicht oder Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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**Course type**

Seminar

**SWS**

2.00

**Frequency**

SuSe and WiSe

**Workload attendance**

28 h