Fachschaft
Mathematics and Computer Science
at Karlsruhe Institute of Technology

# Study Programme Information Mathematics master

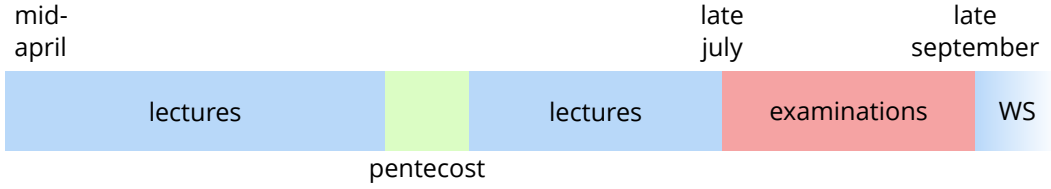
**summer semester 2025**

# General information about your studies

- you take **modules** to complete your studies
- pass the module by **examination**
  - there are written ond oral exams
  - also: practical courses, seminars, thesis
- every module has a fixed amount of **credit points** (ECTS):
  - you need 120 credit points for your masters degree
  - planned to be completed within 4 semesters (30 ECTS/semester)
- grades: 1.0, 1.3, 1.7, 2.0, ..., 4.0 (passed), 5.0 (failed)

# Structure of a Semester

- 3½ months of lectures
- 1½ months “lecture-free period”
  - examinations take place here, usually one exam date per module per semester
- around pentecost: one week lecture break



# The masters programme

# Master of Mathematics

# Mathematics – Structure of your studies

| | Main Subject 1 (24 ECTS) | Main Subject 2 (16 ECTS) | additional maths courses (14–22 ECTS) | Supplementary Subject (16–24 ECTS) | Seminars & SQ (12 ECTS) |
|---|---|---|---|---|---|
| 1 | analysis<br>algebra / geometry<br>numerical analysis<br>stochastics / statistics | | Additional mathematical modules from any of the four subjects | Another mathematical subject or Computer Science, Physics, Economics, Mechanical Engineering, Electrical Engineering | Two seminars (6 ECTS)<br><br>Interdisciplinary Qualifications (6 ECTS) |
| 2 | | | | | |
| 3 | | | | | |
| 4 | Master's Thesis (30 ECTS) | | | | |

# Mathematics – Main Subjects

- 24 ECTS (first subject) and 16 ECTS (second subject)
- Chosen from the four mathematical areas:
  - analysis
  - algebra / geometry
  - numerical analysis / scientific computing
  - stochastics / statistics
- one of the two main subjects must be either analysis or algebra / geometry
- you have to choose two distinct main subjects
- no seminars allowed here

# Mathematics – Supplementary Subject

- 16–24 ECTS
- **Either** another mathematical area
- **or** one of the following subjects
  - Computer Science
  - Physics
  - Economics
  - Mechanical Engineering
  - Electrical Engineering
- Other supplementary subjects or modules not listed in the module handbook can be approved by the examination board.

# Mathematics – Additional Maths Courses

- “Mathematische Vertiefung” 14–22 ECTS
- choose freely from all four mathematical areas
- at most one ungraded seminar

- together with the supplemental subject: 38 ECTS in total

# Master of Mathematics in Technology

# Mathematics in Technology – Structure of your studies

| | **Main subject (24 ECTS)** | **Technical subject (18–27 ECTS)** | **Computer Science (8–17 ECTS)** | **Elective courses (19 ECTS)** | **Internship & SQ (12 ECTS)** |
|---|---|---|---|---|---|
| 1 | Finite Element Methods, analysis, applied mathematics | chemical engineering, electrical engineering, experimental physics, … | various Computer Science lectures | ungraded seminar (3 ECTS) | internship (10 ECTS) |
| 2 | | | | applied mathematics (16 ECTS) | interdisciplinary qualifications (2 ECTS) |
| 3 | | | | | |
| 4 | Master's Thesis (30 ECTS) | | | | |

# Mathematics in Technology – Main Subject

- **applied mathematics**
  - Finite Element Methods (8 ECTS)
  - analysis (8 ECTS)
  - includes modules from all mathematical areas

## Elective courses

- one ungraded mathematical **seminar** (3 ECTS)
- another 16 ECTS of **applied mathematics**

# Mathematics in Technology – Technical subject

- Chosen at the beginning of your studies
- Choose from:

- Constructional Engineering
- Chemistry
- Chemical and Process Engineering
- Electrical Engineering
- Experimental Physics
- Mechanical Engineering
- Mechatronics and Information Technology
- Material Sciences

- Other technical subjects or modules not listed in the module handbook can be approved by the examination board.

# Mathematics in Technology – Technical subject

**Außerdem**:

- **technomathemtical seminar**
  - can be from Mathematics, Computer Science or the technical subject
- the remaining courses must be from the masters programme (or the advanced bachelors programme) of the faculty in charge for the technical subject.
- The selected modules must be approved by the study counsellor from the respective faculty individually.
  - It's best to get all desired modules approved at the beginning of your studies.

# Mathematics in Technology – Internship

- 10 ECTS, not graded
- al least **8 weeks**
- requires supervisor from the company as well as examiner from the faculty
- you have to write a **report** (approx. 10–20 pages).
- under own responsibility with suitable private or public facility
  - **short presentation** (approx. 15 min)

# Informatik

- 8–17 ECTS, combined with the technical subject: at least 35 ECTS

# Master of Mathematics in Economics

# Mathematics in Economics – Structure of your studies

| | **Mathematics (36 ECTS)** | **Economics (36 ECTS)** | **Elective courses (12 ECTS)** | **Seminars (6 ECTS)** |
|---|---|---|---|---|
| 1 | stochastics<br>numerical analysis / scientific computing,<br>analysis<br>algebra / geometry | finance – risk management – managerial economics (18 ECTS)<br><br>operations management – data analysis – computer science (18 ECTS) | Additional modules in Mathematics or Economics | mathematical seminar (3 ECTS)<br><br>economical seminar (3 ECTS) |
| 2 | | | | |
| 3 | | | | |
| 4 | Master's Thesis (30 ECTS) | | | |

# Mathematics in Economics – Mathematics

- modules from all four mathematical areas:
  - analysis
  - numerical analysis / scientific computing
  - stochastics / statistics
  - algebra / geometry
- at least **8 ECTS of stochastics**
- at least **8 ECTS of analysis** or **numerical analysis / scientific computing**

# Mathematics in Economics – Economics

- Two areas:
  - finance – risk management – managerial economics
  - operations management – data anlysis – computer science
- selected modules must be approved by your study counsellor
- see the module handbook for details

# Mathematics in Economics – Elective courses

- 12 ECTS
- can be chosen feely from all mathematical or economical areas
- at most one additional economical seminar
  - useful for specialization in the topic of you thesis

# About seminars

- **Mathematics**: 2 mathematical seminars
- **Mathematics in Technology**: 1 mathematical seminar, 1 technomathematical seminar
- **Mathematics in Economics**: 1 mathematical seminar, 1 economical seminar

- mostly ungraded, but with compulsory attendance
- sign-up often towards the end of the previous lecture period
- notices on the bulletin boards in the mathematics building, as well as in the prospectus

# Interdisciplinary Qualifications

*Events on social topics, supplementary programmes that teach the application of specialist knowledge in everyday working life, skills training for soft skills and foreign languages.*

- **2–6 ECTS** in total
- there are graded and non-graded modules, only the credit points are relevant for the degree.
- diverse selection, e.g.
  - language courses (language centre, not your native language)
  - seminars on self-organisation, presentation (HoC)
  - seminars on culture, politics and economy (FORUM)
  - tutor training: can be taken if employed by a chair

# Master's thesis

- 30 ECTS
- can be started as soon as 70 ECTS have been completed in the masters programme
- written over a period of **6 months**
  - subject can be returned within the first month
- **Mathematics in Economics**: thesis can also be written at the Economics faculty

# Additional modules (“Zusatzleistungen”)

- voluntary additional courses
  - included in your transcript of records
  - do not influence your overall grade
- at most 30 ECTS
- modules can be selected freely, even from unrelated subjects
- have to be marked as “additional module” before the examination

# Campus System

- management of the administrative processes for your studies
  - select modules
  - register and de-register for exams
  - obtain transcripts and certificates
  - re-registration
- **self-management**

  Online at https://campus.studium.kit.edu/english/index.php

# Study Plan – recommendation

- add events to favourites in the Campus System
- then: subscribe to iCal-calendar in Google, Apple, or similar
  - changes sometimes need up to 24h to propagate
- fill in gaps in your own calendar
- Read your KIT E-Mails!

# Certificates

- Certificate of Registration
  - sometimes needed by your health insurance
- KVV-Warrant
  - free local transport in the KVV area together with KIT Card
  - valid on weekends, public holidays, and Mondays to Fridays after 6 PM

# Re-registration

- you have to actively re-register every semester
  - inform KIT that you wish to continue your studies
  - click the feedback button and transfer the money
  - you'll receive a reminder per E-Mail

# Written exams

- dates announced at the beginning of the semester
- registration and de-registration in the Campus System
  - de-registration in the Campus System until midnight before the exam
  - you can still de-register until just before the start of the exam on-site
- two attempts and an oral re-examination
- the second attempt is not mandatory

# Oral exams

- you agree on a date with the examiner or their secretariat
- **also** register in the Campus System
  - de-registration is possible until 3 working days before the exam by E-Mail to you examiner.
  - later cancellation must be approved by the examination board (e.g. due to illness with a medical certificate)
- two attempts

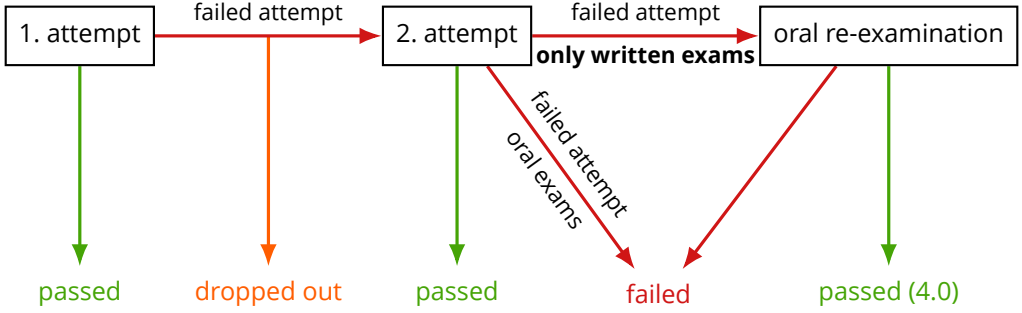
# Exams: Signing up, Writing and Inspection

- you have to sign up in advance in the campus system
  - preferably as soon as possible
  - for oral examniations: make an appointment with your examiner or their secretary
- the exam is failed, if you do not show up after signing up
- grades are published in the campus system
- **visit the examination inspection!**
  - sometimes whole tasks are skipped by accident

# Failed examination: After the Inspection

- you have a **second** attempt (usually in the following semester)
- for **written exams** there is an “oral re-examination” after the second failed attempt
  - timely after the exam
  - the only possible grades are 4.0 (passed) or 5.0 (failed)
- otherwise: “loss of the entitlement for examination”
  - you’ll be exmatriculated
  - you can’t study similar study programs any more, event **at other universities!**
- however, there is the possibility of a **hardship case**
  - more on this later

# Overview of examination attempts



# problems during studies

# The “hardship case”

- formally “Antrag auf Zweitwiederholung”
- if granted, provides a third attempt to examination
  - every grade is possible
  - for written exams you also get another oral re-examination
- needs to be justified
  - decision is made in the “examination board”
  - **contact the “Fachschaft” in advance!**

# Maximum duration of your studies

- at most 8 semesters (mathematics in technology or economics: 7)
- extension is possible by application to the examination board
  - must be handed in before the end of the 8. (or 7.) semester.
  - similar to the “hardship case”, handled by the same commitee.
  - again: **contact the “Fachschaft” in advance!**

# Planned duration of study

- 4 semesters. this is **not** the average duration of study
- mostly only relevant for scholarships and BAföG

# Contact Persons

# Study counselling

- study counselling
- applications to the examination board
- questions regarding the module handbook and examination regulations
- discussion of lesson planning for the supplementary subject

| | |
|---|---|
| Mathematics | Prof. Dr. Tobias Lamm |
| Mathematics in Technology | Prof. Dr. Willy Dörfler |
| Mathematics in Economics | Dr. Bernhard Klar |
| International Master | JProf. Dr. Xian Liao |

https://www.math.kit.edu/lehre/seite/studberatung/en

# Students' Centre of Mathematics

- "Studierendenzentrum Mathematik" (StuZeMa)
- mathematics building (20.30) room 0.003 (next to the "Fachschaft")
- registration / admission / administrations of records (mostly online)
- contact person: Francesco Amoroso

https://www.math.kit.edu/lehre/seite/stuzema/en

# The “Fachschaft”

- office hours
- Mail to mathe@fsmi.org
- Sale of old exams and protocols: `https://exams.fsmi.org`

**“Fachschaft Mathematik”**
ground floor of the mathematics building (room 0.002)

“Fachschaft Informatik”
basement of the Computer Science building (room -124, near ATIS)


Questions?

# Join the active “Fachschaft”

- representation of students interests (e.g. in university commitees)
- we organize parties and also this “O-Phase”
- counselling, old exam and protocol sale, student representation, software projects

**Your path into the “Fachschaft”**

- office hour
- “Semesterauftakttreffen” (SAT, semester kick-off meeting) on Tuesday, 29.04.2025 at 7 PM at the computer science building

# Good luck with your studies!