ETH zürich

Department of Mathematics

Master in Mathematics / Applied Mathematics

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Topics of this event

- MSc Mathematics vs MSc Applied Mathematics – What's the difference? Can I switch?
- Types of course units offered in the programme
- Credit point structure for your degree
- Additional requirements
- Other courses (not listed for mathematics or outside of ETH)
- Advice
- Link list for more information

MSc Mathematics / MSc Applied Mathematics
Your Degree Programme

- Switching between MSc Mathematics and MSc Applied Mathematics is possible at any time until you request your degree

- MSc Applied Mathematics focuses more on applications instead of only mathematical courses

- MSc Mathematics is not a degree in pure mathematics. You still can do applied mathematics, or even focus on it

Course Units: Mathematical Courses

Mathematical courses have **two key properties**:

- **Core / elective:**
  - Core courses are more central and lay foundations for specializations, usually 7-10 credits
  - Elective courses are more specialized, usually 4-8 credits
    - You must take at least two core courses, but you can take more
    - Restriction: At most one of Functional Analysis I, Differential Geometry I, Probability Theory recognisable

- **Pure / applied:**
  - Only matters for the MSc Applied Mathematics
  - 15 credits in applied courses (both core and elective) are necessary in that degree programme

Course Units: Seminars & Semester Papers

- In **seminars**, students give talks and (sometimes) write notes
  - Limited number of participants per seminar. Sign up early!
  - No grades, only pass/fail
  - At least one seminar required in MSc Mathematics

- **Semester papers** are similar in scope and depth to a Bachelor thesis
  - Set up individually with a supervisor, independent of semester dates
  - No grades, only pass/fail
  - At least one semester paper required in MSc Applied Mathematics, at least one semester paper in your Application Area
  - Get organized early, potential supervisors tend to be busy...

- In both programmes, you need (# of seminars) + (# of semester papers) ≥ 2.

Course Units: Application Areas

- Only part of MSc Applied Mathematics
- Courses are related to mathematics, but not math courses
- At least 8 credits needed in exactly one Application Area
  - If you take courses for more than 8 credits, make sure they all belong to the same Application Area
    - It is not possible to choose two Application Areas or to get credit for courses from different Areas
  - One semester paper has to be in your Application Area, as confirmed by your supervisor
- List of Application Areas:
  - Atmospherical physics, Biology, Control and automation, Economics, Environmental science, Finance, Image analysis and computer vision, Information and communication technology, Machine Learning, Material modeling and simulation, Quantum chemistry, Simulation of semiconductor devices, Systems design, Theoretical physics, Transportation science
  - Upon request to the Study Director, you may be granted your „own“ Application Area

Course Units: Science in Perspective

Scientific Works in Mathematics

- Every student writing a paper/thesis at ETH must have taken a course on how to work scientifically before starting the project
  - If you have taken a similar course during your BSc studies, you can be exempted – Contact Andreas Steiger for more information

- Course takes place twice per semester and lasts one hour
  - Tentative dates for the Autumn semester 2024: October 1 and October 29 at 17:15

Credit Point Structure for your Degree – MSc Mathematics

Art. 31 Master's degree in Mathematics

[1] The 90 credits required for the Master's degree must be acquired in the following categories in at least the numbers given. Further details are set out in Para. 2.

a.	[21]**Core courses and electives** *at least 14 of the required 38 credits* must be acquired in core courses	**38 credits**
b.	**Seminars and semester papers** *at least 4 KP of the required 8 credits* must be acquired in seminars	**8 credits**
c.	**Science in Perspective**	**2 credits**
d.	**Master's thesis**	**30 credits**
	sum	***78 credits***

[2] The credits remaining to make up the 90 required must be earned in the categories «Core courses and electives» and/or «Seminars and semester papers».

Credit Point Structure for your Degree – MSc Applied Mathematics

Art. 32 Master's degree in Applied Mathematics

[1] The 90 credits required for the Master's degree in Applied Mathematics must be acquired in the following categories in at least the numbers given. Further details are set out in Para. 2 and 3.

a. [22]**Core courses and electives** **26 credits**

1. Core courses *(at least 14 of the required 26 credits must be acquired in core courses)*
   - Core courses pure mathematics
   - Core courses applied mathematics
2. Electives
   - Electives pure mathematics
   - Electives applied mathematics

Note: In the category «Core courses and electives» at least 14 of the required 26 credits must be acquired in «Core courses applied mathematics» or «Electives applied mathematics».

b. **Application area** **8 credits**

c. **Seminars and semester papers** **12 credits**
   - at least 8 of the required 12 credits must be acquired via semester papers
   - at least one semester paper must address a topic relevant to the selected application area

d. **Science in Perspective** **2 credits**

e. **Master's thesis** **30 credits**

sum ***78 credits***

[2] The credits remaining to make up the 90 required must be earned in one or more of the categories «Core courses and electives», «Application area» and «Seminars and semester papers».

[3] [23]In the category «Application area» (Para. 1 (b)) only credits stemming from the selected application area may be recognised. Credits from other application areas are listed on a separate sheet in the academic record if they cannot be recognised in another category (e.g. «Electives»).

Additional Requirements

- Courses are part of the BSc Mathematics here at ETH and take place once per year, but possibly in German

- You can take them as self-study if the actual course is not taking place

- You need to pass Additional Requirements within 3 semesters, with the first attempt during the first 2 semesters
  - It is up to you how and when you study for Additional Requirements
  - The examiner is always the lecturer who taught the corresponding BSc course most recently
  - Default examination language is English, even if the course was last taught in German

- You can’t get credit for a course which you had as Additional Requirement. An Additional Requirement course does not count toward the 90 credits needed to complete the degree

Courses and projects not listed in the course catalogue

- For course units listed in the ETH course catalogue but not for Mathematics Master, it is possible to file a request for recognition: https://math.ethz.ch/intranet/students/external-courses.html

- For MSc students without ETH BSc Math, **only courses listed in the ETH course catalogue are eligible for credit points**
  - No exchange programmes, no mobility

- The course catalogue contains some courses from University of Zurich
  - Registration at UZH for “module mobility” is before the semester starts
  - Mostly courses for Application Areas
  - UZH courses not allowed if they are not listed in the ETH course catalogue

- Master thesis project outside ETH is only possible in industry of the Greater Zurich Area
  - See the list of permitted supervisors on the Study Administration web pages
  - Exceptions to this rule have to be requested with the Director of Studies

Advice – How to get started

- For Additional Requirements, try to find other students and learn together. Ask the lecturer about additional material like exercise sheets, books, scripts, etc.
  - Studying in groups is more fun and gives you valuable feedback on your progress!

- Many core courses have a first part in autumn and a second part in spring
  - If you do many Additional Requirements in autumn, make sure you'll have enough interesting courses in spring!

- Registration for courses and exams can be undone long enough
  - At the beginning of the semester, sign up for all courses which you might take. Deregister later if needed.
  - The deadline for deregistering from exams is late in the semester. Register, study, prepare, and pull out if needed.

- Don't forget your life besides studying! Do sports, eat well, sleep enough, socialize!

Where to get information on almost anything

Useful resources

- IntraMATH with detailed information for enrolled students:
  math.ethz.ch/intranet/students
- Overview of regulations and study guidelines:
  math.ethz.ch/intranet/students/regulations-and-guidelines
- Student portal of ETH
  ethz.ch/students/en
- List of course websites:
  math.ethz.ch/studies/course-websites/course-list-d-math

Contacts

- Study administration of D-MATH:
  math.ethz.ch/intranet/students/study-administration
- Study advisor:
  math.ethz.ch/intranet/students/consulting

Q & A – Please ask *any* question!