M.Sc. Mathematics

A degree programme of the Faculty of Computer Science and Mathematics

The information in this infosheet is pertinent for the degree programme starting in winter semester 2026-27.

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Programme web page
Information for prospective students

Download the infosheet in PDF format

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How to apply

Language of instruction: The entire programme is taught in English.

Entry qualifications

You are eligible for this degree programme if you have an undergraduate/first university degree (Bachelor's degree, *Magister, Diplom*, state examination or equivalent) in mathematics or a related discipline with a **mathematics component of at least 90 ECTS credits**, earned in a study programme of a standard length of three years, with a **final grade of 2.7** under the German marking system or the relevant equivalent grade in a foreign marking system. Those who have not attained a minimum grade of 2.7, or the relevant foreign equivalent, may still apply if they can prove that they were among the best 70% of graduates of their cohort.

Unless English was the language of instruction for your prior education, you should provide an **English language certificate** at **level B2** of the Common European Framework of Reference for Languages (CEFR), such as:

- TOEFL (567 paper-based, 87 internet-based, ITP 543 'silver' or better)
- IELTS (score 5.5)
- Cambridge English Language Assessment at level 'Advanced' (CAE) or 'Proficiency' (CPE)

or an equivalent. A first degree or secondary **education completed exclusively in English** also counts as proof of English-language proficiency.

International applicants with a university degree from abroad must provide proof of German language proficiency at **level A1 CEFR** (beginner's level). If you do not have proof of German proficiency at the time of application or enrolment, you can submit it during your first year at the University of Passau.

Starting your studies before completing your prior undergraduate degree

If you cannot provide your final bachelor's (or equivalent) university degree certificate and transcript/final student record at the time of application or enrolment, you may submit a written request to the Board of Examiners asking for an extension of the submission deadline by which you have to submit your first degree certificate and outlining the reasons why you are unable to provide them at the current time. The Board of Examiners will grant you a deadline up to no later than the *tenth week of lectures of the first semester*. For this to be approved, you must have already completed all coursework and assessments for your first degree at the beginning of the degree programme at the University of Passau and have submitted a (preliminary) transcript showing a (preliminary) grade of 2.7 or an equivalent foreign grade.

Application

Starting semester: This programme starts in April and October each year.

The **application deadline** for the October intake is **31 May**; for the April intake it is **15 December.**

Please apply online.

If you have any questions on the application process, please contact the Student Registration Office, Innstr. 41, 94032 Passau, Germany; phone: +49 851 509 1127; e-mail: registry@uni-passau.de.

Information for new students

Please visit our website to find out everything you need to know as you're starting out on your studies and for information on the Orientation Weeks.

The following videos are particularly helpful for new students and are available with English subtitles:

- At the start of the degree programme
- Semester cycle
- Important documents for your studies
- ECTS credits and the standard period of study
- Course types
- Language courses and placement tests
- Examinations
- Online portals for your studies
- Scientific methods
- Leisure activities
- Advice centres

Modules, module catalogue, overall grade calculation, courses

The curriculum is modularised, and each module has a specific ECTS credit load. When you pass a module exam, you acquire the number of ECTS credits allotted for that module. You will also receive a mark on your exam; however, this does not affect the number of ECTS credits awarded – you receive the full credit load for a pass and no credits for a fail. As this master's degree programme comprises a total of 120 ECTS credits, you should aim to gain **approx. 30 ECTS credits each semester** to complete the programme within the standard period of study.

In the **module catalogue** you will find detailed descriptions of the content of all modules and courses, as well as any module prerequisites and information on the examination format. There is no fixed sequence in which you should complete your module examinations; however, you should generally pass the introductory modules before attempting the more advanced modules.

All modules except the "Counselling Module" are examination modules. The final grade for your degree is calculated based on the ECTS-weighted module marks of the examination modules and the mark you attain on your master's thesis.

The individual courses for the modules can be found in **Stud.IP**, the University's learning management system: Course directory for Master's programmes

PROGRAMME STRUCTURE

The degree programme is divided into a compulsory area (15 ECTS credits) and a compulsory elective area (78 ECTS credits) as well as the Master's thesis (27 ECTS credits). In total, you must accumulate **120 ECTS credits** to successfully complete the programme**.**

When planning out your studies, please use the **module catalogue** and check that your modules are applicable to the Subject-specific Study and Examination Regulation of the programme.

Compulsory modules

You must complete all compulsory modules (**15 ECTS credits**):

Course format	Module name	Type of assessment	WCH	ECTS credits
(L)	Counselling Module	Portfolio/written exam	1	2
(S)	Module Seminar 1 on mathematics	Essay/paper and its presentation	2	5
(S)	Module Seminar 2 on mathematics	Essay/paper and its presentation	2	5
(Pr)	Module Presentation of the Master's thesis	Presentation	-	3
In total: 4 modules				**15**

Compulsory elective module groups

Credit requirements:

You will earn a total of **78 ECTS credits** in compulsory elective module groups. These are divided as follows:

- In the compulsory elective **module areas A and B**, you will complete modules amounting to a **minimum of 55 ECTS credits**. Of these, **at least 18 ECTS credits must come from each of the two module areas A and B.**
- Furthermore, at least **10 ECTS** credits must stem from the **module groups "AI and Data Science" and "Applications".**
- Up to **5 ECTS** credits can stem from **"Occupational Skills"** modules.
- The credits remaining to achieve 78 ECTS credits can be freely chosen from all compulsory elective module groups.

Module area A

You must choose modules amounting to a minimum of 18 ECTS credits. These are divided in two module groups:

Module group "Algebra and Discrete Structures"

This module group imparts advanced aspects of algebra and discrete mathematics which provide the basis for algorithmic calculations, e.g. in cryptography as well as in many other areas of mathematics.

Course format	Type of assessment	ECTS credits
Lectures with/without exercise or seminar	Written exam or oral exam or portfolio or report	5–9 each

Module group "Logic and Geometry"

The theoretical possibilities and limitations of algorithmic problem solving are discussed from a logical perspective. The connections between logic and geometry are explained.

Course format	Type of assessment	ECTS credits
Elective modules	Written exam or oral exam or portfolio or report	3–9 each

In total (module area A):	**at least 18**

Module area B

You must choose modules amounting to a minimum of 18 ECTS credits. They are divided in two module groups:

Module group "Applied Analysis and Optimisation"

The modules cover methods from applied analysis and optimisation for modelling and approximating continuous and discrete data and systems as well as the efficient numerical implementation and evaluation of these methods.

Course format	Type of assessment	ECTS credits
Lectures with/without exercise or seminar	Written exam or oral exam or portfolio or report	5–9 each

Module group "Functional Analysis and Stochastics"

The modules cover methods, in particular functional analytical methods, for modelling and analysing complex random phenomena as well as the construction, analysis and optimisation of stochastic algorithms and methods of statistical data analysis.

Course format	Type of assessment	ECTS credits
Lectures with/without exercise or seminar	Written exam or oral exam or portfolio or report	5–9 each

In total (module area B):	**at least 18**

Total of module areas A and B:	**at least 55**

Additional compulsory elective module groups

Credit requirements:

- You must complete modules amounting to at least **10 ECTS credits** from the module groups “AI and Data Science” and “Applications”.
- Up to **5 ECTS credits** can stem from “Occupational Skills” modules.

Module group “AI and Data Science”

This module group covers core methods of computer science relating to AI methods and the analysis of data from different modalities (e.g. multimedia data, social networks, sensors) and the implementation of data analysis systems.

Course format	Type of assessment	ECTS credits
Lectures with/without exercise or seminar	Written exam or oral exam or portfolio	5–9 each

Module group “Applications”

This module group covers the practical application of the mathematical methods taught in module groups A and B in various areas of application.

Course format	Type of assessment	ECTS credits
Lectures with/without exercise	Written exam or oral exam or portfolio	5–9 each

In total (module groups “AI and Data Science” and “Applications”):	**at least 10**

Module group “Occupational Skills”

This module group contains transferable skills modules supporting students in their studies and preparing them for professional life after university, e.g. language modules, academic writing, internships and other key skills.

Course format	Type of assessment	ECTS credits
Lectures with/without exercise/seminar/internship	Written exam or oral exam or portfolio or lab report	1–4 each

In total (module group “Occupational Skills”):	**up to 5**

Total of all compulsory elective modules:	**78**

During your studies

Studying or working abroad as part of the degree programme

During your studies you can study or complete an internship abroad.

Internships

If you complete an internship you may have it counted towards your M.Sc. Mathematics degree with **four ECTS credits** as a module in the “Occupational Skills” module group. Please consult the **module catalogue** for information on acceptance for credit and the acceptance process. If you have any questions about the internship, you may contact the academic adviser.

Master’s thesis

When writing your thesis, you will demonstrate your ability to independently carry out academic research by applying scientific methods to a defined subject matter.

Prior to commencing the thesis, you will have to accumulate a minimum of 70 ECTS credits in this degree programme.

You will be given **six months** to write the thesis, which should be written in German or English. Once you achieve a pass mark on your thesis, you are awarded **27 ECTS credits** for it.

Completing your degree studies

You have passed the master's examination when you have gained pass mark on all required modules and the master's thesis, and acquired at least 120 ECTS credits. You will then graduate and be awarded the degree of **Master of Science (M.Sc.)**.

At the end of the degree programme, you should submit a written request for your final degree documents (i.e. the final transcript, degree certificate etc.) to the Examinations Office.

Voluntary completion of additional modules

If you earn more than the required 120 ECTS credits in your degree programme, these additional credits are listed separately in your final transcript. However, the marks attained in these additional modules do not count towards the final grade for your degree.

You can acquire various additional qualifications and certificates, and all students enrolled at Bavarian universities can take advantage of the online courses of the Bavarian Virtual University (Virtuelle Hochschule Bayern).

Doctoral study

This Master's programme enables you to work according to scientific principles and thus gives you the prerequisites for doctoral study. When undertaking a doctoral project, you should ideally have already done research in the field of your future doctoral topic in your master's thesis. If you are considering doctoral study, you should contact the supervisor for your Master's thesis. The University of Passau offers excellent conditions for pursuing a scientific research project within the framework of a doctorate.

Important examination-related rules and regulations

Study and examination regulations; module catalogue

- General Study and Examination Regulation (AStuPO) for the Master's degree programmes of the faculty
- Subject-Specific Study and Examination Regulation (FStuPO) (German text)
- Module catalogue

Standard and maximum length of the programme

The standard period of study is **four semesters** (120 ECTS credits).

The maximum duration of study is six semesters. If you have not passed all required examinations after the sixth semester, you will fail the degree programme in the first instance; however, you will then be given an additional two semesters in which to complete the missing assessments. This period is not interrupted by a leave of absence or de-registration.

If you have not passed all required modules by the end of the eighth semester, you will fail the programme without the possibility of re-sitting the examinations. It is important to understand that this "*endgültig nicht bestanden*" status, which means "final fail", also bars you from enrolling in the same degree programme at other German universities.

Counselling module and guidance interview

During your first year on the programme, you are required to complete a guidance interview with a module convenor – a professor who is in charge of one of your modules. A record will be issued as proof that you have completed this interview.

Exceeding the deadline after the second or third semester

You have to acquire at least **30 ECTS credits** by the end of the **second** semester. If this requirement is *not* met, you must gain at least **40 ECTS credits** by the end of the **third** semester. If you fail to do so, you will be de-registered from the programme and lose your right to take the final examination.

Resits

You may resit failed module examinations up to *two times*. You may re-attempt a failed master's thesis *once*; however, you must do this with a new topic.

You may *not* voluntarily resit examinations for modules you have passed in an attempt to improve your mark.

Credit transfers

If you wish to apply for a credit transfer, please contact the module convenor or the Board of Examiners of the Faculty of Computer Science and Mathematics. Module convenors are listed in the module catalogue. The credit transfer form can be downloaded from the Examinations Office.

Cheating in examinations; plagiarism

If you attempt to influence the result of an assessment by cheating (e.g. plagiarism or use of unauthorised examination aids), the assessment in question is assigned a mark of 5.0 (“insufficient”, “nicht ausreichend”) or “fail” (“nicht bestanden”).

When preparing written work such as seminar papers, master's theses, etc. you must do so in compliance with the University of Passau's Rules for the Ascertainment of Good Research Practice. Such written work should usually be submitted in electronic form.

Illness and inability to attend examinations

If you fall ill before an exam, you must decide, before commencing the exam, whether you want to withdraw from it due to illness. You will need to provide a medical certificate. If you fall ill during an exam and have to abort it, you also have to provide a medical certificate.

In either case you must submit the completed Inability to Attend Examinations Due to Illness Form at the earliest opportunity. You should submit the form and medical certificate to the Examinations Office as described in the information sheet on inability to attend examinations.

If you fall ill for a longer period of time during the semester, it may be expedient for you to take leave of absence for the whole semester. If that is the case, please seek advice from the Student Registration Office and the Advice Centre for Students with Disabilities and Chronic Illnesses.

Academic adjustments/exam access arrangements

If you have a disability or suffer from a chronic or psychological illness, you may be able to apply for academic adjustments, including access arrangements (e.g. extra time for written exams). The Advice Centre for Students with Disabilities and Chronic Illnesses will be happy to advise and support you with your application.

Service and advice centres

Academic Advice Service

The Academic Advice Service staff provide general advice on all degree programmes and on questions that may arise during your studies. Please make an appointment if you wish to talk to us in person, by telephone or online.

Academic Advice Service, Innstr. 41, 94032 Passau
Drop-in hours: Wednesdays 9:00–12:00
Phone: +49 851 509 1154
E-mail: advice@uni-passau.de

Programme adviser

Please contact the programme convenor if you have in-depth questions, particularly if you are at an advanced stage of the programme:

Professor Tobias Kaiser
Room 228 IM, Innstrasse 33, 94032 Passau
Phone: +49 851 509 3138
E-mail: tobias.kaiser@uni-passau.de

Support for international students

International students at the Faculty of Computer Science and Mathematics are supported by the **International Coordinator** and the **International Student Assistants** (master-help@fim.uni-passau.de).

Examinations Office

The Examinations Office has overall responsibility for all exam-related matters. Visit the Examinations Office website for important information and applications concerning your degree programme.

Student Committee (FS Info)

FS Info, the student committee ("Fachschaft") of the Faculty of Computer Science and Mathematics, can help you with matters related to student life from a student perspective. Together with the faculty, it organises the Orientation Week before the start of studies, represents student interests in the University's policy committees and organises a range of leisure activities.

Room IM 244, Innstrasse 33
Phone: +49 851 509 3004
E-mail: fsinfo@fim.uni-passau.de

IEEE Student Branch Passau

The Institute of Electrical and Electronics Engineers (IEEE), is the world's largest professional association for electrical engineering and computer science. The IEEE Student Branch Passau organises first-semester events and workshops and establishes contacts with industry through excursions and company presentations.

All advice services and student societies can be found on our website.