Deutscher Akademischer Austauschdienst
German Academic Exchange Service

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Master's degree

Master of Science in Scientific Computing

Heidelberg University • Heidelberg

Overview

Degree	Master of Science
In cooperation with	Interdisciplinary Center for Scientific Computing (IWR)
Teaching language	• English
Languages	The core programme is held in English. Selected optional courses can be held in German. The MSc Scientific Computing is an international Master's course of study and can be completed entirely in English.
Programme duration	4 semesters
Beginning	Winter and summer semester
Application deadline	Final deadline: 15 June (for the following winter semester) and 15 November (for the following summer semester)
Tuition fees per semester in EUR	Varied
Additional information on tuition fees	For students from non-EU countries, the tuition fees for Master's programmes amount to 1,500 EUR per semester.
Combined Master's degree / PhD programme	No
Joint degree / double degree programme	No
Description/content	Applied mathematics and computer science form the basis of this research-oriented Master's programme in Scientific Computing. Students learn to develop mathematical algorithms, implement them into own code and solve application-driven problems from all areas of science and engineering as well as the humanities. The curriculum is research-oriented by design: core modules lead to specific research areas connected to the research groups at the hosting university's institutions. During their studies, participants are guided to select more specific modules, enabling them to understand the latest research in the fields of mathematics and computer science in one of three core tracks: • machine learning and data analytics • numerical modelling, simulation and optimisation

- visual data analysis and computer graphics

The selection of an application area ensures the direct link between the theoretical part of the programme and the practical application of all methods and techniques. Graduates will be able to use and expand mathematical methods and models for any application field in science and industry.

While working on their Master's theses, participants develop all of the necessary skills for a self-reliant scientific career: problem analysis, entrepreneurship, project management and agile development. Internships at companies guarantee the direct contact to future employers.

Course Details

Course organisation	The first and second years of the Master's programme are clearly divided. The first year provides in-depth knowledge in advanced methods of applied mathematics as well as computer science. These two modules lay the basis for a solid understanding both of the methodology in mathematics needed in order to be successful in scientific computing and of the tools and techniques required to implement these methods efficiently in modern software systems. The application component can be selected from a wide range of fields including physics, astronomy, biosciences, computational chemistry, or economics. Two seminars or traineeships complement the lecture blocks to ensure that practical application of the course content is a major part of the educational concept. First year schedule: Lecture series Mathematics I and II (16 CP) Lecture series Computer Sciences I and II (16 CP) Application fields I and II (18 CP) Two seminars or traineeships (12 CP) The second year of the Master's programme is dedicated to research in the field of the Master's thesis. Students choose from a set of lecture series, including, e.g. image processing, numerical solution of PDE, or analytical modelling, to extend their knowledge in one methodological area. Training in interdisciplinary skills is a key qualification for future researchers in scientific computing. A seminar on topics of the Master's thesis and research and documentation of the thesis project completes the second-year curriculum. Second year schedule: Major lecture series I and II (16 CP) Interdisciplinary skills (6 CP) Master's seminar (6 CP) Master's thesis (30 CP)
A Diploma supplement will be issued	No
International elements	• Study trips • Projects with partners in Germany and abroad
Integrated internships	An internship in industry should be completed after the first year of study. Programme advisers will assist students in finding an appropriate internship.
Course-specific, integrated German language courses	No
Course-specific, integrated	No

English language courses	

Costs / Funding

Tuition fees per semester in EUR	Varied
Additional information on tuition fees	For students from non-EU countries, the tuition fees for Master's programmes amount to 1,500 EUR per semester.
Semester contribution	Approx. 150 EUR per semester
Costs of living	Approx. 750 EUR per month
Funding opportunities within the university	Yes
Description of the above-mentioned funding opportunities within the university	The Hans-Peter Wild Talent scholarships are awarded once a year, at the start of each winter semester, to highly gifted up-and-coming students from Germany and abroad who want to study in a Bachelor's or Master's degree programme in the MINT field (mathematics, computer science, natural sciences, technology) at Heidelberg University. www.uni-heidelberg.de/en/friends-supporters/hans-peter-wild-talent-scholarships

Requirements / Registration

Academic admission requirements	• Bachelor's degree in mathematics, computer sciences, scientific computing, or equivalent (study time of at least three years in a relevant field) • letter of motivation (English)
Language requirements	International applicants (holding a BA) must prove their English skills (TOEFL iBT with score 90 or better out of 120) or CEFR (level B2).
Application deadline	Final deadline: 15 June (for the following winter semester) and 15 November (for the following summer semester)
Submit application to	Applicants can apply online on the application portal heiCo: https://heico.uni-heidelberg.de/heiCO/ee/ui/ca2/app/desktop/#/login?$ctx=lang=en Further information on the application process: https://mastersc.iwr.uni-heidelberg.de/application-admission/how-to-apply

Services

Possibility of finding part-time employment	The faculty offers student jobs such as undergraduate teaching on a semester-by-semester basis.
Accommodation	Accommodation is available through student services or on the private market. Rent for a single room in a student residence is approx. 220 EUR. Private accommodation can be found online at: http://www.wg-gesucht.de.
Career advisory service	The graduate school HGS MathComp organises meetings with local and international employers.
Support for international students and doctoral candidates	• Welcome event • Cultural and linguistic preparation • Visa matters
Supervisor-student ratio	1:4

Heidelberg University

Great Hall of the Old University Building

Heidelberg University, founded in 1386, is Germany's oldest university and has one of the strongest research profiles in all of Europe. The current successes in the Excellence Initiative and in internationally recognised rankings prove that Heidelberg's excellent reputation and leading role in the scientific community is well-deserved. In terms of educating students and promoting promising early-career academics, Heidelberg University relies on its two strongest points: research-based teaching and superlative, well-structured training for doctoral candidates.
Heidelberg University is a comprehensive university, offering the full spectrum of disciplines in the humanities, law, and the social sciences alongside the natural and life sciences, including medicine. As a comprehensive university, Heidelberg aims to continue to strengthen the individual disciplines and to further interdisciplinary cooperation, as well as to carry research results over into society and industry.
With its aspiration of connecting traditional values with future-oriented scientific concepts in research and teaching, the university is building bridges to the future.
Heidelberg University's twelve faculties, including the two medical faculties in Heidelberg and Mannheim, boast a total enrolment of over 30,000 students. With over 160 study programmes, Heidelberg University offers a spectrum of subject combinations nearly unparalleled in Germany. This unique range creates an optimal setting for individualised and interdisciplinary studies.

University location

Heidelberg's cosmopolitan and student-friendly atmosphere is one of the city's distinguishing characteristics. Heidelberg is a lively centre of the Rhine-Neckar metropolitan region and is marked by its high density of research-intensive industry and conglomeration of scientific research institutions. These institutions, working alongside the university, form an internationally competitive research network, providing a wide assortment of contact and cooperation possibilities for researchers and students at Heidelberg University.
Situated in one of Germany's most beautiful cities, the university offers a varied programme of events alongside work and studies. Both the city and the university offer sports and leisure activities, as well as numerous theatres, renowned film and music festivals and a large number of museums, creating a sophisticated and diverse cultural atmosphere. Popular local tourist destinations include the world-famous Heidelberg Castle, the historic streets and alleys in the old city and the Philosopher's Path, one of the most beautiful mountain hiking trails in Europe, as well as many fine restaurants.

Contact

Heidelberg University
Faculty of Mathematics and Computer Science

Dr Michael J. Winckler

Im Neuenheimer Feld 205
69120 Heidelberg

Tel. +49 62215414430
mastersc@iwr.uni-heidelberg.de
Course website: https://mastersc.iwr.uni-heidelberg.de/home

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