Deutscher Akademischer Austauschdienst
German Academic Exchange Service

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Master's degree

MSc Microsystems Engineering

University of Freiburg • **Freiburg im Breisgau**

Overview

Degree	Master of Science
Teaching language	• English
Languages	Courses are held in English. Participants can choose to write their Master's theses in English or German.
Programme duration	4 semesters
Beginning	Winter semester
Application deadline	**Non-EU applicants**: 1 May (early bird); 31 May (final deadline) **EU applicants**: 15 July
Tuition fees per semester in EUR	Varied
Additional information on tuition fees	The state of Baden-Württemberg implemented study fees for international students as well as students earning a second degree starting in the 2017/18 winter semester. Here you will find further information about tuition fees: www.studium.uni-freiburg.de/en
Combined Master's degree / PhD programme	No
Joint degree / double degree programme	No
Description/content	Microsystems, MEMS or micromachines: there are many names for an exciting and dynamic study field that combines expertise from areas as diverse as electrical and mechanical engineering, manufacturing technology, biology and chemistry. It thus allows engineers to conceive highly miniaturised, multifunctional systems that are used for objectives such as medical and diagnostic purposes, in communication and information systems, and in the automotive industry. The Microsystems Engineering programme (MSE) is an interdisciplinary programme that builds on a basic knowledge in electrical and mechanical engineering. The programme combines extensive coursework in advanced microsystems engineering with a concentration in one of the following subdisciplines: • Circuits and systems • Biomedical engineering • Materials and fabrication

- Photonics

The required Master's thesis will be based on project work performed directly in a professor's research group, giving the graduate extensive, hands-on experience using the state-of-the-art microsystems infrastructure at the Department of Microsystems Engineering (IMTEK).

Course Details

Course organisation	The first year of the programme is very demanding. According to the recommended study plan, the MSE students complete the following compulsory courses, providing the fundamental theoretical framework: • Microelectronics • Micromechanics • Microsystems Design Laboratory • MSE Technology and Processes • Signal Processing In addition, the students will choose five out of eight courses offered in the Advanced Microsystems area: • Assembly and Packaging Technology • Micro-optics • Modelling and System Identification • Probability and Statistics • Sensors • Biomedical Microsystems • Microactuators • Microfluidics In the second, third and fourth semesters, MSE students will complete several courses in their chosen **concentration area,** thus allowing each student to realise their individual interests and obtain an in-depth look at a sub-discipline of this very broad, interdisciplinary field. The following concentration areas are offered: • Circuits and systems • Biomedical engineering • Materials and fabrication • Photonics Essential for the successful completion of the Master's degree is the submission of a**Master's thesis,** which is based on a project performed during the fourth semester of the programme. During this time, each student works as a member of one of the 20 research groups of the department, with full access to laboratory and cleanroom infrastructure. If the Master's thesis topic is chosen from the same area that a student chose as his or her concentration area, it will be mentioned as a specialisation in the degree certificate.
A Diploma supplement will be issued	Yes
International elements	• International guest lecturers • Specialist literature in other languages • Training in intercultural skills • Projects with partners in Germany and abroad
Integrated internships	Internships are not an integral part of the curriculum. Nevertheless, students are free to take a leave of absence in order to do an internship in a company.

Course-specific, integrated German language courses	No
Course-specific, integrated English language courses	No

Costs / Funding

Tuition fees per semester in EUR	Varied
Additional information on tuition fees	The state of Baden-Württemberg implemented study fees for international students as well as students earning a second degree starting in the 2017/18 winter semester. Here you will find further information about tuition fees: www.studium.uni-freiburg.de/en
Semester contribution	180 EUR per semester: • Administrative fee: 70 EUR • Contribution to the constituted student body: 7 EUR • Contribution to the student union: 103 EUR
Costs of living	Participants must ensure that sufficient funding is available to finance their participation in a course of study. The average cost of living in Freiburg for one month is currently approx. 850 EUR to 1,000 EUR. Some details: • Rooms in private accommodation including extra costs: 350 EUR – 700 EUR • Rooms in student residences: 250 EUR and 550 EUR including extra costs • Private expenses amount to around 350 EUR per month. • Health insurance (recommended) is available for approx. 120 EUR per month. • Transport: A special student ticket for regional transport costs approx. 89 EUR per semester. www.studium.uni-freiburg.de/en/counseling/welcome-guide-for-international-students/finance
Funding opportunities within the university	Yes
Description of the above-mentioned funding opportunities within the university	There is one scholarship scheme for students who obtained an excellent result in their undergraduate studies (final grade of 1.5 or better in the German grading system). More information on Deutschlandstipendium: http://www.studium.uni-freiburg.de/en/counseling/scholarship-advising/deutschlandstipendium-germany-scholarship?searchterm=deutschlandstipendium&s

Requirements / Registration

Academic admission requirements	Applicants must have a Bachelor's degree in an engineering discipline, such as: • Mechatronics • Mechanical • Electrical • Electronics Engineering OR they must have a Bachelor's degree in a closely related field with an excellent cumulative GPA or final grade. Previous knowledge in mathematics, physics, chemistry, technical mechanics, electronics and materials is crucial for admission.
Language requirements	Exemption from submitting an English language certificate is only granted to native speakers from the USA, UK, Ireland, Australia, New Zealand and Canada or students who completed their Bachelor's in one of these countries. All other candidates have to submit one of the following English language certificates: • TOEFL iBT, minimum 95 points • Academic IELTS, minimum 7.0 • Cambridge Certificate of Advanced English or • Cambridge Certificate of Proficiency in English • Pearson PTE Academic (min. 76) • TELC • TOEIC • UNIcert III or IV
Application deadline	**Non-EU applicants**: 1 May (early bird); 31 May (final deadline) **EU applicants**: 15 July
Submit application to	You will find all information about the application procedure on ourwebsite.

Services

Possibility of finding part-time employment	Qualified students may easily find opportunities for research and teaching assistantships within the laboratories of the Department of Microsystems Engineering (IMTEK).
Accommodation	As Freiburg is an attractive city, finding a suitable and affordable place to live can take a little while. The University of Freiburg offers all newly enrolled international students the possibility to apply for student housing via the International Office. In addition to these dormitories, which are run by the Studierendenwerk Freiburg (www.swfr.de/en), several independent residence halls are listed on the university website (http://www.housing.uni-freiburg.de). The Studierendenwerk Freiburg and the International Office also offer a list of available private rooms.
Career advisory service	The university offers the following career services: • Company visits • Discussions with and talks from employers • Advising on application procedures and documents
Support for international students and doctoral candidates	• Welcome event • Buddy programme

- Tutors
- Accompanying programme
- Specialist counselling
- Cultural and linguistic preparation

Supervisor-student ratio	450 microsystems engineering students (undergraduate and postgraduate), 23 professors, approx. 300 scientific staff and 12 administrative staff

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The MSE programme is a comprehensive programme covering every aspect of MEMS. Highly equipped laboratories and cleanroom facilities are among the distinct facets of this course of study. Lectures are challenging and relate directly to ongoing research activities at IMTEK. The most admirable thing about this course is its diversity and the freedom that students have to select concentration subjects, regardless of their previous academic backgrounds.

University of Freiburg

Traditional and modern: the University of Freiburg in Germany

© Universität Freiburg - Sandra Meyndt

The University of Freiburg was founded in 1457 as a classical comprehensive university, making it one of the oldest institutions of higher education in Germany. Awarded for its excellence in both research and teaching, the university also boasts a long history, with numerous Nobel laureates. Brilliant scholars and creative thinking distinguish it today as a modern, top-notch university, well equipped for the challenges of the 21st century. As an organisation with around 24,500 students, 288 degree programmes, and 6,536 employees (2021), the University of Freiburg is committed to family friendliness, equal opportunities, and environmental consciousness in its day-to-day operations. The structure of the university is multifaceted, ranging from 11 academic faculties – from the humanities and the social and natural sciences all the way to engineering – to 19 research centres. This goes to show that we are a dynamic, large-scale institution with a diverse educational offering. As studies, research, and continuing education are all an integral part of this offering, we maintain a close relationship with the city and the region as well as with the international academic community. Bilateral partnerships, research projects, joint study courses and memberships in international networks such as the League of European Research Universities (LERU) and of EUCOR – The European Campus are examples of the university's strong transnational relations. All our students, including those from abroad, can take courses at the Universities of Basel (Switzerland) and Strasbourg (France) without having to enrol. Via EUCOR, The European Campus mobility grant, they also receive allowances for travel expenses to their partner institutions.

universität freiburg

University location

Freiburg im Breisgau is a city in south-western Germany on the edge of the Black Forest. Freiburg was founded by Konrad and Duke Bertold III of Zähringen in 1120 as a free market town – hence its name, which translates to "free town". Freiburg holds a central position in Europe at the trijunction of Switzerland, France, and Germany, and is the city with the most hours of sunshine per year in Germany. It is nestled in one of the oldest cultural landscapes north of the Alps, a location which has had an unmistakable influence on the town. The university plays an essential part in the quality of life in Freiburg; both in the academic sphere and in the perception of the general public, the activities of the university are of central importance. Since its founding, teaching, learning and research have formed an indivisible whole.

With approx. 230,000 inhabitants, Freiburg has a friendly size, offering the safe surroundings of a smaller city whilst at the same time excelling in terms of culture, shopping and infrastructure. Both the inhabitants and the city government of Freiburg attach great importance to ecological values and sustainable development. This "green city" atmosphere influences many aspects of city life – from the numerous cyclists on the streets to cutting-edge solar energy research. Surrounded by the beautiful landscapes of the Black Forest and the wine-growing regions of the Rhine Valley, Freiburg is a popular destination for tourism and leisure activities.

Contact

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Faculty of Engineering
Admissions Office

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