

Faculty of Engineering at FAU



Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) offers a broad range of studies which is unique in its diversity compared to other German universities. The Faculty of Engineering (TF), one of the five faculties at FAU, has an excellent reputation in science as well as in commerce. During the last 50 years, highly qualified engineers and computer scientists have been educated in more than 40 highly modern and interdisciplinary degree programmes.

Numbers and facts of FAU (2018/2019)	Numbers and facts: Faculty of Engineering (2018/2019)
38,771 students	10,332 students
265 degree programmes	40 degree programmes
94 Master's degree programmes	20 Master's degree programmes
8 elite degree programmes	4 elite degree programmes
31 early degree programmes	6 early degree programmes

City of Erlangen and Region

Open to the world and with a strong standing in economics: Erlangen is a lively city full of students located at the centre of the dynamic “Metropolis of Three Cities”: Erlangen-Nürnberg-Fürth. With more than 100.000 inhabitants (one third of them students), Erlangen has the ideal size for living, learning and enjoying time. The wide range in the fields of culture and leisure activities offers many possibilities for night owls as well as for culture and sports enthusiasts.

For more information, see: www.erlangen.de or www.metropolregionnuernberg.de

Student Counseling

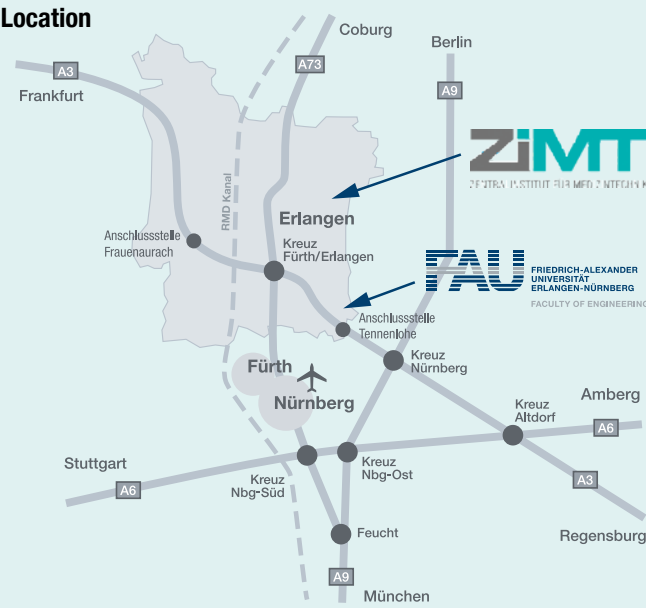
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www.tf.fau.de
(Faculty of Engineering)



www.medical-engineering.study.fau.eu



For arrival by train, car or bus, please check:
www.tf.fau.de/infocenter/campussuche

Master of Science (M.Sc.)
Medical Engineering



www.medical-engineering.study.fau.eu

What is Medical Engineering?

The constant progress in medicine drives engineers to search for innovative developments and improving processes to support medical staff, caregivers and patients. The need for highly qualified experts with a profound knowledge in various technical areas (computer science, electrical engineering, materials science, mechanical and biochemical engineering) and with an additional medical background has increased rapidly over the past ten years. Therefore, many graduates with a technical Bachelor's degree choose to continue their studies in our Medical Engineering Master's programme. On the one hand, students can acquire all the necessary skills for the booming healthcare industry – on the other hand, it still offers a broad and solid engineering education. This flexible profile enables our graduates to work in almost every technical environment as well as in the MedTech sector.

Fields of Activity

- Further/new development of imaging techniques
- Development of highly complex devices for diagnostics and therapy
- Development and application of new materials for implants and prostheses
- Development of surgical robots and assisting systems
- Development of health applications and supporting systems for daily life

In addition to work in research and development, various promising job opportunities are currently available for graduates of our M.Sc. in Medical Engineering. These include areas such as product management, technical maintenance, sales and consulting. Furthermore, due to the agile healthcare market, graduates have a great opportunity to found a start-up company – either during or after their studies.

Advantages of Obtaining a Degree in Erlangen

Being located in the Medical Valley of Germany, the European Metropolitan Region Nuremberg (Nürnberg), students can choose from an enormous number of internships and student job offers from regional MedTech companies and participate in many health-related activities, such as digital health challenges, hackathons and collaboration projects. Our university partners include research institutions, like Fraunhofer Society or Max-Planck Institutes, as well as industry partners (e.g. Siemens Healthineers, Adidas). With this strong network, it is no surprise that FAU was named Germany's most innovative university of the year 2018. Additionally, FAU offers an international exchange programme with more than 300 leading partner universities – mainly from European countries. Consequently, students get the opportunity to make international contacts.

FACTS

The master’s programme is a technical and research-oriented set of studies with a focus on medical solutions. It is designed for a regular study period of four semesters. These are to convey profound engineering competences and – besides specialised methodical knowledge – continuative interdisciplinary competences for qualifying in the occupational field of medical engineering.

Master’s Programme

- The FAU offers 5 different master degree branches within the Medical Engineering programme. Two of these are completely taught in English:
- Medical Image and Data Processing (English or German → 2 separate branches)
 - Health & Medical Data Analytics and Entrepreneurship (English)
 - Medical Electronics (German)
 - Medical Production Technology, Device Engineering and Prosthetics (German)

Requirements for Access and Enrolment

- A subject-related qualification for university entrance at master’s level (e.g. a technical bachelor’s degree)
- Passing the Qualification Assessment (QFV)
- Either English or German language certificate (depending on your chosen branch)

Note that having studied Medical Engineering does not automatically qualify you for entering our Master’s programme. In spite of this, you do not necessarily need a degree in Medical Engineering to join the programme!

→ You can find all the details concerning the application process on our website: www.medical-engineering.study.fau.eu (Prospective Students → Joining the Master Degree Programme)

Structure

- Semester 1 & 2 Engineering core subjects, in-depth medical subjects, medical engineering core subjects, interdisciplinary competences
- Semester 3 In-depth medical engineering subjects, soft skills, laboratory internships, research internship
- Semester 4 Master’s thesis → Degree: **Master of Science**

STUDY PROGRAMME MEDICAL ENGINEERING (MT)

General Overview (Branch-independent)

This schedule is a recommendation. However, except for the Master’s thesis in the fourth semester, you can vary the order arbitrarily.

Module Group		ECTS credits	Module	Workload per Semester			
No.	Name			1 st semester	2 nd semester	3 rd semester	4 th semester
M1	Medical specialisation modules	10	General module catalogue	5	5		
M2	Engineering core modules	20	Branch-specific module catalogue	10	10		
M3	Medical Engineering core modules	20	Branch-specific module catalogue	10	10		
M4	Advanced seminar MT	5	General seminar catalogue			5	
M5	Medical Engineering specialisation modules	10	Branch-specific module catalogue		5	5	
M6	Medical Engineering practical modules	10	General module catalogue			10	
M7	Flexible budget Faculty of Engineering (TF)	10	All modules offered by TF			10	
M8	Free choice Uni (FAU)	5	All modules offered by FAU	5			
M9	Master’s thesis & accompanying seminar	30 (thesis: 27.5 credits, seminar: 2.5 credits)					30
Sum:		120					

There is a general study module catalogue which applies for all study branches. You can find the current modules here: www.medical-engineering.study.fau.eu/current-students/general-study-information-masters-program

There is a specific module catalogue for each branch. The modules of one branch can also be used for other branches in module groups, like M6 or M7, to a certain extent.

PERSPECTIVES

Master Degree Branches

- **Medical Image and Data Processing**
This specialisation is taught either in German or in English (two separate branches). Deepened expertise and methodological competence about software systems in medical engineering are to be acquired. They range from basic algorithms for image enhancement, image reconstruction, image registration and computer-based diagnosis to medical information systems.
- **Health & Medical Data Analytics and Entrepreneurship (HMDA)**
The programme – which is funded by the European Institute of Innovation and Technology (EIT-Health) – offers students a robust entrepreneurship education together with an innovative pedagogy in healthcare data analytics. Through international student mobility and cross-organisational internships, a unique multidisciplinary profile is created.
- **Medical Electronics**
In the medical electronics programme, in-depth skills regarding hardware and software systems of medical devices are acquired. Fundamental knowledge of the engineering sciences in the field of electrical engineering, electronics, and information technology are the basis for this branch.
- **Medical Production Technology, Device Engineering and Prosthetics**
In this branch of study, the graduates gain in-depth expertise and methodological competence for construction and manufacturing of high-class medical-technical devices and implants in consideration of the interdependency with the special biological surroundings at or within the human body.

Besides obligatory and optional modules, the flexible Master’s programme includes courses for personal competence build-up and for the Master’s thesis. Additionally, a research internship is integrated in the curriculum, which deepens scientific work. Depending on the branch of studies, students may choose from several alternatives of the particular obligatory modules of the respective course. The M.Sc. graduation is the precondition to continue your research-oriented career with a PhD programme.

What about Career Prospects?

The global market for medical devices is valued at approximately 300 billion Euros at present and it is constantly growing. Even now, the health market is one of the most important industries in Germany and provides employment to 13.5% of the workforce. Graduates can choose from a great variety in job offers: working for one of the big players, doing research for renowned institutes, founding a start-up company or working in a healthcare institution – the choice is almost limitless!

Ratio of Subjects in the Master Studies

The choice of the specific branch of studies is determined by your exam registration. Each branch has its own engineering focus.

