

# Faculty of Engineering

Where 'Made in Germany' comes to life

International Master's and doctoral degree programmes

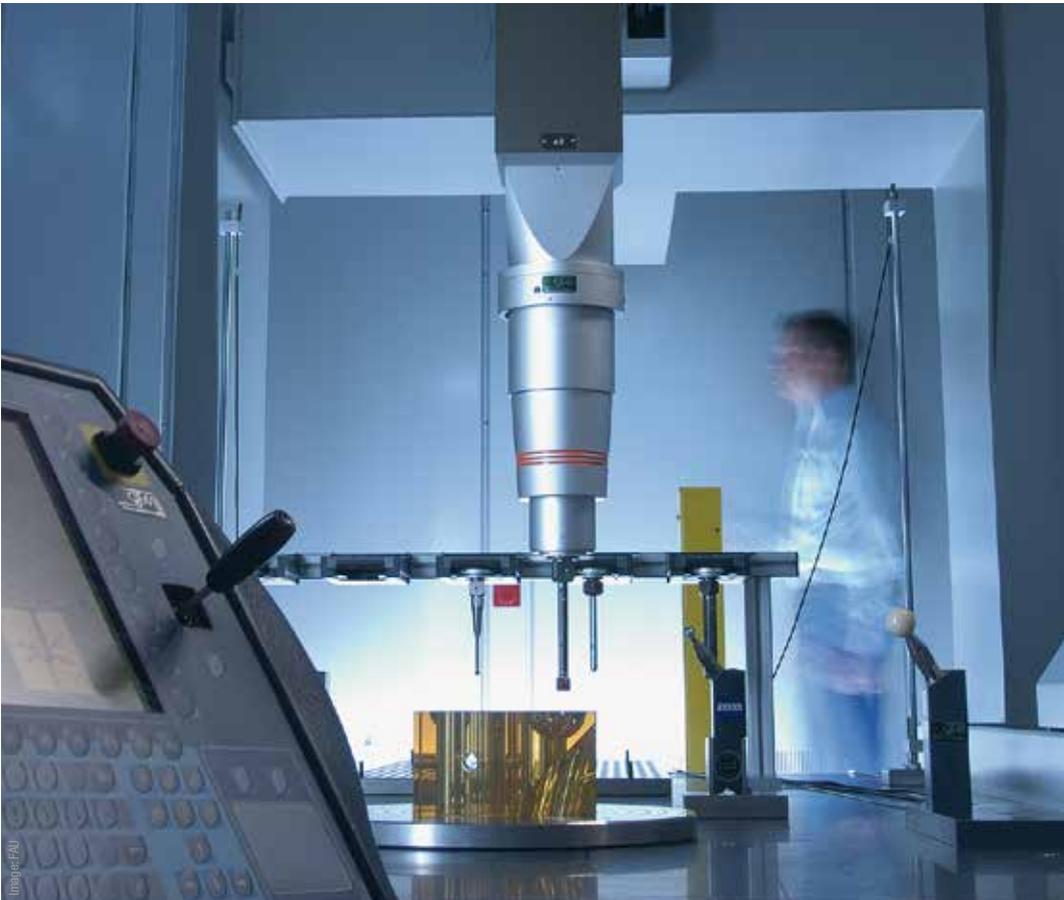




Image: FAU



# Friedrich-Alexander-Universität Erlangen-Nürnberg

## Advance through networks

Founded in 1743, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), with its 39,000 students and more than 650 professors, is not only a university with an excellent national and international reputation but is also an important economic force in the region. Its five faculties cover the entire spectrum of modern academic disciplines, giving rise to an almost unique range of interdisciplinary degree programmes. High-profile national and international awards as well as excellent placements in research rankings are proof of its research achievements. The close dialogue between 5 faculties, 23 departments and numerous subjects reflects FAU's emphasis of collaboration in the spirit of 'Advance through networks'.

FAU is part of a vast international network and maintains close ties with 500 partner universities in 70 countries. It is one of the most attractive German universities for guest researchers from abroad. Every year more and more Humboldt scholars and award-winning researchers choose to base themselves at this Northern Bavarian university.

The Excellence Initiative launched by the German federal and state governments provides an outstanding environment for training and research at the University. In this inspiring environment, our students benefit from an outstanding academic education with an international perspective and excellent career opportunities.

## UNIVERSITY PROFILE

- 2 Cities:** Nuremberg (population 500,000), Erlangen (population 100,000)
- 5** faculties
- 23** departments
- 244** degree programmes
- 24** clinical departments
- 254** chairs
- 580** professorships
- 39,000** students
- 13,000** staff

## RESEARCH HIGHLIGHTS

- 1** Cluster of Excellence 'Engineering of Advanced Materials' (EAM)
- 1** Graduate School as part of the German Excellence Initiative (SAOT)
- 1** Helmholtz Institute for Renewable Energy (HI ERN)
- 4** DFG Collaborative Research Centres
- 8** DFG Research Groups
- 3** Transregios
- 8** DFG Research Units
- 8** DFG Research Training Units
- 1** Max Planck Institute for the Science of Light
- 2** Fraunhofer Institutes

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# Faculty of Engineering

## Science – Research – Teaching

The Faculty of Engineering was founded in 1966, and has since established an excellent reputation in research. In terms of the amount of funding per professor, it consistently ranks among the leaders for the highly competitive and prestigious research funding awarded by the German Research Foundation (DFG).

### The Faculty of Engineering consists of five departments:

- Chemical and Biological Engineering
- Computer Science
- Electrical Engineering
- Materials Science and Engineering
- Mechanical Engineering

Its areas of expertise include health technology (in co-operation with Siemens Healthcare), engineering of advanced materials (with a Cluster of Excellence that is part of the German Excellence Initiative), optics (in co-operation with the Max Planck Institute for the Science of Light) and microelectronics and nanoelectronics (in co-operation with the biggest Fraunhofer Institute in Germany where the world-famous MP3 format was invented).

As the world of engineering is becoming increasingly interdisciplinary, many of the chairs at the Faculty of Engineering work closely with another in collaborative projects, as well as with chairs at other FAU faculties and other universities. Numerous collaborative projects involving

partnerships between industry and the University guarantee that research findings are rapidly transferred to practical applications.

### The Faculty of Engineering currently concentrates on the following research fields:

- New materials and processes
- Life science engineering and health technology
- Energy technology and mobility
- Modelling and simulation
- Optics and optical technologies
- Information and communication technologies
- Microelectronics and nanoelectronics

We are confident that our international and interdisciplinary programmes are of great interest for all prospective students who are open-minded and keen to take part in the international field of engineering.

### FACULTY OF ENGINEERING

- 5** departments
- 56** chairs
- 101** professorships
- 10,500** students
- 12%** international students



Image: Faculty of Engineering

# Degree programmes

The Faculty of Engineering offers a wide range of degree programmes. Those marked with **(E)** are taught mainly in English and students do not require knowledge of German to be admitted (with the exception of Chemical and Biological Engineering and International Project Management in Systems Engineering). This brochure provides detailed information on these degree programmes taught in English.

Courses with 'hons.' are offered as part of the Elite Network of Bavaria and are designed for especially highly motivated and gifted students.

- Advanced Materials and Processes, MSc **hons. (E)**
- Advanced Optical Technologies, MSc **(E)**
- Business Information Systems, BSc, MSc
- Chemical and Biological Engineering, BSc, MSc **(E)**
- Chemical Engineering – Sustainable Chemical Technologies, MSc
- Communications and Multimedia Engineering, MSc **(E)**
- Computational Engineering, BSc, MSc **(E)**, MSc **hons. (E)**
- Computer Science, BSc, MSc
- Computer Science and a subject from the humanities or social sciences, BSc
- Education (Computer Science), BSc, MSc
- Electrical Engineering, Electronics, and Information Technology, BSc, MSc
- Energy Technology, BSc, MSc

- Industrial Engineering and Management, BSc, MSc
- Information and Communication Technology, BSc, MSc
- International Information Systems IIS, MSc
- International Production Engineering and Management, BSc, MSc
- International Project Management in Systems Engineering, MSc **(E)**
- Materials Science and Engineering, BSc, MSc
- Life Science Engineering, BSc, MSc
- Mechanical Engineering, BSc, MSc
- Mechatronics, BSc, MSc
- Medical Engineering, BSc, MSc
- Medical Engineering, branch of study Medical Image and Data Processing, MSc **(E)**
- Nanotechnology, BSc, MSc
- Teaching Engineering in Vocational Schools, BSc, MSc

### Doctoral Programmes

Additionally, you can do your doctoral degree (Dr.-Ing.) in nearly all of these fields of study. For specific enquiries, you can find contact details on our website. ([www.tf.fau.eu/the-faculty/departments-chairs.shtml](http://www.tf.fau.eu/the-faculty/departments-chairs.shtml))

The Faculty of Engineering offers some structured doctoral degree programmes, such as the Graduate School of Advanced Optical Technologies (SAOT) programme. You will find these structured doctoral degree programmes in this brochure.



# Advanced Optical Technologies (MAOT)

Master of Science

Image: Bilderdienst Optische Technologien

**Optical technology is crucial for scientific and industrial development in the 21st century. The Master's degree programme in Advanced Optical Technologies (MAOT) provides extensive training in all applied fields of modern optical technologies.**

Erlangen is one of the leading centres of excellence for optics and optical technologies in Germany and the world. In addition to the MAOT, the SAOT doctoral degree programme in optical technologies and the Max Planck Institute for Science of Light are also located in Erlangen. The application of optics in medicine is supported by an outstanding hospital infrastructure. Two Fraunhofer Institutes, a Helmholtz Institute and the Bavarian Laser Centre complete the picture.

**The two-year programme covers seven topics:**

- Optical metrology
- Optical material and systems
- Optics in communication
- Computational optics
- Optics in medicine
- Optical material processing
- Physics of light

Students are taught the fundamentals of optics and lasers, and receive an introduction to all seven topics, from which they choose two as major subjects. In this interdisciplinary programme, lectures are given by experts from physics, medicine, computer science and engineering (electrical engineering, mechanical engineering and chemical engineering).

MAOT has its own teaching rooms and computers for its students. Lectures are held in small groups with a high level of interactivity. The programme is part of the Elite Network of Bavaria. MAOT collaborates closely with the SAOT programme and the Max Planck Institute for the Science of Light.

<b>DEGREE</b>	Master of Science
<b>DURATION</b>	4 semesters
<b>PLACE OF STUDY</b>	Erlangen
<b>PREREQUISITES</b>	Good Bachelor's degree or equivalent in a relevant engineering programme or physics
<b>LANGUAGE OF PROGRAMME</b>	English (German language skills are an advantage, but not mandatory)
<b>APPLICATION DEADLINE</b>	For international students: 15 April For German students: 15 July
<b>CONTACT ADDRESS</b>	Dr. Jürgen Großmann Paul-Gordan-Straße 6, 91052 Erlangen, Germany
<b>PHONE</b>	+49 9131 8525857
<b>EMAIL</b>	maot@aot.uni-erlangen.de
<b>INTERNET</b>	www.aot.fau.de



# Graduate School of Advanced Optical Technologies (SAOT)

Dr.-Ing./Dr. rer. nat.

Image: Bilderdienst Optische Technologien

**Advanced Optical Technologies  
(doctoral programme)**

The Graduate School in Advanced Optical Technologies (SAOT) offers graduates the opportunity to carry out doctoral research at FAU's Faculty of Engineering, Faculty of Science and Faculty of Medicine.

It covers six fields of research: metrology, material processing, medicine, communication and information technologies, materials and systems, and computational optics. Doctoral candidates work on research projects in one of these fields under the supervision of an SAOT principal investigator. In addition to their main field, each doctoral candidate chooses two additional areas in which they attend courses and workshops to acquire a broad knowledge of optical technology. Classes on the fundamentals of optics and optical technologies are also a mandatory part of the programme.

During the programme doctoral candidates have the opportunity to attend academies which encourage intensive teamwork to find solutions to problems in the field of optics. A credit point scheme encourages doctoral candidates to attend scientific conferences, workshops and lectures, publish scientific papers and acquire key qualifications.

Research at SAOT can be undertaken in collaboration with three leading research centres in Erlangen: the Bavarian Laser Centre, the Fraun-

hofer Institute of Integrated Systems and Device Technology, and the Max Planck Institute for the Science of Light

**Some typical research topics include:**

- Particle images for turbulent transport phenomena in combustion systems
- Sensor-regulated tissue-specific laser
- Lithographic projection imaging and related optical proximity effects
- Quantification and differentiated analysis of protein concentration in the aqueous humour

<b>DEGREE</b>	Dr.-Ing. or Dr. rer. nat.
<b>DURATION</b>	7 or 8 semesters
<b>PLACE OF STUDY</b>	Erlangen
<b>PREREQUISITES</b>	Excellent Master's or Diplom degree in engineering or physics
<b>LANGUAGE OF PROGRAMME</b>	English
<b>APPLICATION DEADLINE</b>	Applications are accepted at any time
<b>CONTACT ADDRESS</b>	Dr. Jürgen Großmann Paul-Gordan-Straße 6, 91052 Erlangen, Germany
<b>PHONE</b>	+49 9131 8525850
<b>EMAIL</b>	saot@aot.uni-erlangen.de
<b>INTERNET</b>	www.aot.fau.de/SAOT/glance/

# Chemical and Biological Engineering (CBI)

Master of Science

## The fascinating world of chemical and biological conversion of materials and related processes

This interdisciplinary programme allows students to specialise in the fields of biotechnology, technical chemistry, process engineering, product design and thermo-fluid dynamics.

Chemical and Biological Engineering (CBI) is a consecutive degree programme which follows on from Bachelor of Science degrees (usually 6 semesters) and leads to a Master of Science degree (usually 4 semesters). Some of the subjects in the Master's degree programme are taught in English, but the majority of them are held in German. Knowledge of German is therefore necessary.

### Career prospects

One of the main tasks of chemical and biological engineers is to develop processes for material conversion on a laboratory scale and implement them on a production scale.

By optimising these processes they work to improve product characteristics and to reduce unwanted by-products and waste. Chemical and biological engineers are found not only in the chemical industry but also in the oil industry, the pharmaceutical industry, the food processing and beverages industries, plant construction, the automotive industry, energy engineering and the environmental protection sector. Chemical and biological engineers carry out jobs with a

high level of responsibility in the fields of research and development, production, plant design, construction and operation, marketing and management.

<b>DEGREE</b>	Master of Science
<b>DURATION</b>	4 semesters
<b>PLACE OF STUDY</b>	Erlangen
<b>PREREQUISITES</b>	Excellent Bachelor's degree in chemical and biological engineering. The Admissions Committee decides on the equivalence of alternative qualifications
<b>LANGUAGE OF PROGRAMME</b>	English and German level B2 required
<b>APPLICATION DEADLINE</b>	15 July for the winter semester, 15 January for the summer semester

<b>CONTACT ADDRESS</b>	Dr. Anna Hilbig Haberstr. 2, 91058 Erlangen, Germany
<b>PHONE</b>	+49 9131 8567599
<b>EMAIL</b>	anna.hilbig@fau.de
<b>INTERNET</b>	www.cbi.studium.fau.de

Image: Faculty of Engineering, ISTM

# Chemical and Biological Engineering (CBI)

Dr.-Ing.

## Chemical and Biological Engineering (doctoral programme)

The Department of Chemical and Biological Engineering provides research opportunities leading to a doctoral degree in one of its areas of specialisation.

### The following list gives just a small insight into the diversity of possible research topics:

chemical reaction engineering (catalysis, ionic liquids), separation processes (crystallisation, high pressure extraction), thermodynamics (combustion, laser diagnostics), process machinery (failure diagnosis, vibration analysis), particle technology (multiphase flows, nanoparticles), fluid mechanics (aerodynamics, biological processes), and biological process technology (cell culture, marine and plant biotechnology).

For admission to the doctoral degree programme in Chemical and Biological Engineering an outstanding degree in chemical engineering, bioengineering or, in exceptional cases, mechanical engineering at the Master's degree or Dipl.-Ing. level is expected. A good background in mathematics and computer programming are desirable. Candidates whose postgraduate degree is not equivalent to the Chemical and Biological Engineering Master's degree may be required to take selected lectures or complete practical work in a preparatory course. A good command of English is essential and basic knowledge in German is recommended. German

language classes, if necessary, form part of the preparatory course and the main doctoral degree programme.

<b>DEGREE</b>	Dr.-Ing.
<b>DURATION</b>	About 6 semesters
<b>PLACE OF STUDY</b>	Erlangen
<b>PREREQUISITES</b>	Outstanding Master's degree or Dipl.-Ing. degree or equivalent in chemical engineering or a related subject; good background in mathematics and experience in computer programming; proof of financing and supervision
<b>LANGUAGE OF PROGRAMME</b>	English (TOEFL advisable); German (400 hours of German language study are recommended)
<b>APPLICATION DEADLINE</b>	Applications are accepted at any time; there are no deadlines. Scholarship applications (DAAD, etc.) must be submitted up to 12 months in advance

<b>CONTACT ADDRESS</b>	Prof. Dr.-Ing. Antonio Delgado, Dipl.-Biol. Sonja Hupfer Cauerstr. 4, 91058 Erlangen, Germany
<b>PHONE</b>	+49 9131 8529500
<b>EMAIL</b>	lstm-sekretariat@fau.de
<b>INTERNET</b>	www.cbi.fau.de

Image: Faculty of Engineering, ISTM



Elitenetzwerk  
Bayern



# Computational Engineering (CE)

## Master of Science

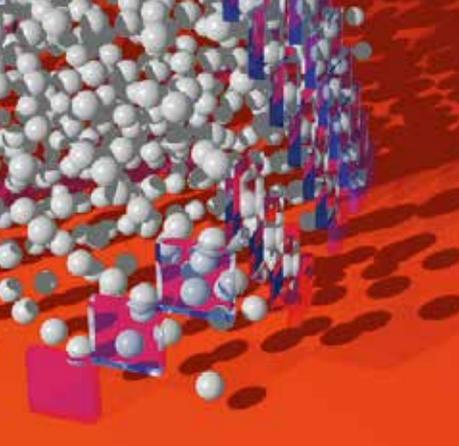


Image: FAU

### Computational Engineering – Combining classical German engineering skills with high-performance computing expertise

The international Master's degree programme in Computational Engineering goes beyond the traditional German engineering education and applied mathematics to prepare students perfectly for the new challenges in simulation and modelling.

#### It is designed to allow students to study computer science together with one of the following fields of engineering of their choice, called the technical application field (TAF):

- Automatic Control
- Computational Materials Science
- Computational Optics
- Information Technology
- Mechatronics
- Medical Engineering
- Solid Mechanics and Dynamics
- Thermodynamics and Fluid Dynamics

**'Do more – get more':** Particularly excellent students will have the opportunity to join the Bavarian Graduate School of Computational Engineering from the second semester. They will attend additional courses, some of which are held at Technische Universität München, and improve their soft skills to achieve the title 'Master of Science with honours' as part of the Elite Network of Bavaria (ENB).

**Double degree:** After one year of studies in Erlangen, students have the possibility to achieve

a double degree by studying two semesters at the renowned Royal Institute of Technology (KTH) in Stockholm, Sweden.

#### Career prospects

Simulation of technical processes, scientific visualisation, process optimisation, virtual product development and design decisions

<b>DEGREE</b>	Master of Science / Master of Science with honours
<b>DURATION</b>	4 semesters
<b>PLACE OF STUDY</b>	Erlangen
<b>PREREQUISITES</b>	Excellent Bachelor's degree or equivalent qualification in computer science, in a related field of science or engineering, or in mathematics
<b>LANGUAGE OF PROGRAMME</b>	English (TOEFL or equivalent); German language skills are an advantage, but not mandatory
<b>APPLICATION DEADLINE</b>	15 April (international students who need a visa) 15 July
<b>CONTACT ADDRESS</b>	Dipl.-Biol. Christine Mohr Erwin-Rommel-Str. 60, 91058 Erlangen, Germany +49 9131 8527851
<b>PHONE EMAIL</b>	ce-master@informatik.uni-erlangen.de
<b>INTERNET</b>	www.ce.fau.de

# Computational Engineering (CE)

## Dr.-Ing.

Image: SAM Journal on Scientific Computing



### Computational Engineering (doctoral programme)

The Computational Engineering (CE) doctoral degree programme welcomes excellent graduates with outstanding degrees in mathematics, computer science or one of the technical application fields offered at FAU, especially if they have an interest in interdisciplinary research. During the programme, doctoral candidates are expected to present their research at national and international conferences, and to publish their research results in international journals. Due to the application-orientated focus of this research, a variety of local, national and international companies and research institutions collaborate with departments of FAU's Faculty of Engineering, such as Siemens, Lucent, BMW, AUDI, Ericsson and Fraunhofer Institutes.

#### Possible fields of research include, for example:

- Computer science (embedded systems, pattern recognition, computer graphics)
- Information technology (digital signal processing, digital transmission)
- Mechatronics (mechatronics and sensor technology with emphasis on numerical simulation)
- Computational optics
- Computational fluid dynamics
- Automatic control (discrete control)
- Computational mechanics (biomechanics)

Although the general courses for the doctoral degree programme are offered in English, an in-

tegral part of the programme is the free selection of specialised courses, some of which are held in German only. Furthermore, doctoral candidates are expected to participate in university teaching. The programme includes German language courses.

Each doctoral candidate is assigned to an individual supervisor responsible for the scientific aspects of their studies.

<b>DEGREE</b>	Dr.-Ing.
<b>DURATION</b>	6 semesters
<b>PLACE OF STUDY</b>	Erlangen
<b>PREREQUISITES</b>	Excellent Bachelor's and Master's degree or equivalent qualification in computer science, in a related field of science or engineering, or in mathematics; a good GRE score (General Test)
<b>LANGUAGE OF PROGRAMME</b>	English
<b>APPLICATION DEADLINE</b>	Applications are accepted at any time
<b>CONTACT ADDRESS</b>	Elisabeth Mayer, LL.M., MBA Erwin-Rommel-Str. 60, 91058 Erlangen, Germany
<b>PHONE EMAIL</b>	+49 9131 8528688 ce-phd@informatik.uni-erlangen.de
<b>INTERNET</b>	www.ce.fau.de/phd-program/

# Communications and Multimedia Engineering (CME)

Master of Science

Students who strive to understand the underlying principles of current communication and multimedia technologies will find a stimulating environment in the CME degree programme and will learn to apply solid theory to achieve practically relevant solutions.

CME is designed for graduates of Bachelor's degree programmes in electrical engineering, communication engineering, computer science, applied mathematics or physics and focuses on the fundamental concepts of advanced communications and multimedia.

The main contributors to the curriculum are the Chair of Multimedia Communications and Signal Processing, the Chair of Information Transmission, and the Institute for Digital Communications. Based on a profound and broad working knowledge in these key areas, students are also encouraged to pursue their personal interests in areas such as audio, electronics, optical communication systems or medical image and video processing. In this way, the curriculum paves the way to careers in research and advanced development in world-class academic institutions and industry for audio, multimedia, and communications, and many other areas where these qualifications are in high demand.

The programme structure complies with internationally recognised Master's degree programmes and meets the requirements for subsequent doctoral studies.

**Career prospects:** Basic and applied research, product development, maintenance and customer support, sales and distribution, project management, consulting, patent law, employment at public authorities.

<b>DEGREE</b>	Master of Science (MSc)
<b>DURATION</b>	4 semesters
<b>PLACE OF STUDY</b>	Erlangen
<b>PREREQUISITES</b>	Bachelor's degree in information and communication technology, electrical engineering, computer science or a related subject. Allocation of study places is based on academic performance
<b>LANGUAGE OF PROGRAMME</b>	English
<b>APPLICATION DEADLINE</b>	Applicants from Germany and other EU countries: 15 May Applicants from non-EU countries: 15 March

**CONTACT ADDRESS** Dipl. Pol. Joanna Kudanowska  
Cauerstr. 7,  
91058 Erlangen, Germany

**PHONE** +49 9131 8527155

**EMAIL** cme@eei.uni-erlangen.de

**INTERNET** www.cme.studium@uni-erlangen.de

Image: Faculty of Engineering/Kudanowska

# International Project Management in Systems Engineering (IPM)

Master of Science

**Solutions for the growing challenges of design and implementation of large-scale process plants**

The International Project Management in Systems Engineering degree programme connects technical knowledge of systems engineering with the required management techniques. This synergic combination enables graduates to understand the comprehensive field of systems engineering and to manage the implementation of large-scale plants successfully.

The IPM programme leads to a Master of Science degree (usually 4 semesters). Almost half of the courses in this Master's degree programme are taught in English. The remaining courses are taught in German, therefore knowledge of the German language is a mandatory requirement. The IPM Master's degree programme offers versatile possibilities for students to choose interesting subject specialisations, develop their own personal profile and obtain the required qualification for a subsequent doctoral degree programme.

**Career prospects:** Large-scale technical projects such as power plants, process plants, infrastructural projects and construction projects are growing faster than any time before. Meanwhile, the complexity is increasing due to the ever more demanding requirements with regard to technical content, security, efficiency, economy and cultural environment. A project manager who manages such projects must be educated

in both engineering and economics. Sound knowledge of commercial law is also an advantage due to associated topics such as shareholder management and risk management. Furthermore, project managers must have good negotiation skills and need to act strategically. Project management is not limited to the chemical, oil or pharmaceutical industry, but is also required in the food processing and beverage industries, plant construction, the automotive industry, the energy industry and the environmental protection sector; there is a remarkable demand.

<b>DEGREE</b>	Master of Science (MSc)
<b>DURATION</b>	4 semesters
<b>PLACE OF STUDY</b>	Erlangen and Nuremberg
<b>PREREQUISITES</b>	Excellent Bachelor's degree in engineering; written application with work sample
<b>LANGUAGE OF PROGRAMME</b>	English level B2 (TOEFL advisable); German level C1
<b>APPLICATION DEADLINE</b>	15 July for the winter semester

**CONTACT ADDRESS** Dr.-Ing. Nicolas Ait  
Cauerstr. 4,  
91058 Erlangen, Germany

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**EMAIL** info-ipm@ipat.fau.de

**INTERNET** www.ipm.studium.fau.de

Image: YanLiu/Shutterstock.com

# Advanced Materials and Processes (MAP)

## Master of Science with honours

Image: Faculty of Engineering

### A unique combination of chemical and biological engineering with materials science and engineering

Advanced Materials and Processes (MAP) is an international English-taught programme, leading to the degree of Master of Science with honours. MAP has been supported since 2005 by the Elite Network of Bavaria (ENB). Aiming to pool regional strength in advanced materials and processes, the programme is hosted in Erlangen and involves contributions from its partner universities in Bayreuth and Würzburg.

By providing students with a cutting edge education, MAP is training the next generation of engineers with the skills necessary to produce innovative materials in the most efficient and sustainable way.

### MAP is built around the following four focal subjects with students specialising in two from the second semester onwards:

- Advanced Processes
- Biomaterials and Bioprocessing
- Computational Materials Science and Process Simulation
- Nanomaterials and Nanotechnology

The intensive study of these topics together with the associated project work provides students with broad career opportunities in industry as well as in academia.

### The MAP environment

MAP is greatly enriched by the direct involvement of the partner universities of Bayreuth and Würzburg. Local research centres as well as the Cluster of Excellence 'Engineering of Advanced Materials' are also directly involved in MAP.

<b>DEGREE</b>	Master of Science with honours
<b>DURATION</b>	4 semesters
<b>PLACE OF STUDY</b>	Erlangen
<b>PREREQUISITES</b>	Excellent Bachelor's degree or equivalent in chemical and bioengineering, materials science or related subjects as well as admission granted by the Admissions Committee
<b>LANGUAGE OF PROGRAMME</b>	English proficiency demonstrated through a high TOEFL or IELTS score
<b>APPLICATION DEADLINE</b>	Applicants from non-EU countries: 31 March Applicants from EU countries: 15 July

**CONTACT** Katrin Bartels, BA, MA, Claudia Bayer, BA, MSc  
**ADDRESS** Haberstr. 2, Room 0.62, 91058 Erlangen, Germany  
**PHONE** +49 9131 8528620  
**EMAIL** map-applications@fau.de  
**INTERNET** www.elite-map.techfak.fau.de



Image: Kurt Fuchs

# Medical Engineering

## Master of Science

### Engineering meets medicine

Increasing progress in medicine requires innovative development and improved procedures, especially in the field of medical engineering. The Medical Engineering Master's degree programme provides a specific interdisciplinary education based on solid technical studies along with basic medical knowledge.

It is open to students with a Bachelor's degree in Medical Engineering or a related field of engineering. All applicants have to pass a qualification assessment procedure (QFV), which has a strong focus on programming skills, computer science, electrical engineering and mathematics.

Within the Master's degree programme, the branch of study 'Medical Image and Data Processing' is offered completely in English. It provides students with in-depth expertise and methodological skills related to software systems in medical engineering. These range from basic algorithms for image enhancement, image reconstruction, image registration, and computer-based diagnosis support to medical information systems.

In addition to compulsory and elective modules, the Master's degree programme includes core skills courses, a research placement and the Master's thesis.

<b>DEGREE</b>	Master of Science
<b>DURATION</b>	4 semesters
<b>PLACE OF STUDY</b>	Erlangen
<b>PREREQUISITES</b>	Bachelor's degree in engineering or equivalent qualification in a related subject; proof of English proficiency (internet based TOEFL min. 90, paper based TOEFL min. 577, IELTS min. 6.5, Cambridge Certificate in Advanced English or UNICert III)
<b>LANGUAGE OF PROGRAMME</b>	English
<b>APPLICATION DEADLINE</b>	15 July (for the winter semester), 15 January (for the summer semester)

**CONTACT ADDRESS** Claudia Barnickel  
Martensstraße 3,  
91058 Erlangen, Germany  
**PHONE** +49 9131 8567337  
**EMAIL** studienberatung@zimt.uni-erlangen.de  
**INTERNET** www.medizintechnik.studium.fau.de



## Excellent support for excellent students

Image: Shutterstock

### Elite Network of Bavaria

#### The best possible support for outstanding talents at Bavarian universities

In 2004, the Bavarian government launched a programme in collaboration with the Bavarian Business Association with the goal of supporting young academic talents.

Three of the international Master's degree programmes at the Faculty of Engineering belong to this programme, the Elite Network of Bavaria:

- Advanced Optical Technologies
- Advanced Materials and Processes
- Bavarian Graduate School of Computational Engineering

#### The Elite Network of Bavaria provides ideal conditions for highly qualified students

The special degree programmes include a remarkably large proportion of practical courses (e.g. project work). In addition, students are offered soft skills courses in which they acquire key skills regarding economics, management and personal training.

Students are also invited to attend summer or winter academies. The courses offered in these academies range from specific subject-related courses to soft skills workshops.

The elite degree programme runs in parallel to the standard degree programme. Successful students are awarded a Master's degree with honours.  
([www.elitenetzwerk.bayern.de](http://www.elitenetzwerk.bayern.de))

#### Excellence Initiative

In 2005, the German federal and state governments agreed on an initiative to promote top-level research in Germany. The Excellence Initiative aims to strengthen science and research in Germany in the long term, improve its international competitiveness and raise the profile of the country's top performers in academia and research.

**Graduate schools** such as SAOT at the Faculty of Engineering help to ensure quality is maintained by supporting young researchers and are based on the principle of training outstanding doctoral candidates in an excellent research environment.

**Clusters of excellence** such as Engineering of Advanced Materials at the Faculty of Engineering enable German universities to establish internationally visible, competitive research and training facilities, thereby enhancing scientific networking and collaborations among the participating institutions.  
([www.eam.uni-erlangen.de](http://www.eam.uni-erlangen.de))



Image: FAU

## Good to know

#### Tuition fees

Tuition fees in Germany are comparatively low. As of 2015/16, FAU currently does not charge tuition fees but requires students to pay 107 euros per semester for transport and student services.

All university facilities can be used by students free of charge. There is no charge for examinations. Some specific language courses must be paid for separately.

#### Scholarships

FAU does not have a general scholarship scheme. However, some of the degree programmes presented in this brochure offer scholarships (e.g. SAOT).

The German Academic Exchange Service (DAAD) offers scholarships for international students (<http://www.daad.de>).

#### Support when you arrive in Erlangen

The international degree programmes provide special support services for students during their first few weeks in Erlangen. They provide assistance with matters such as accommodation, registration and insurance. Additionally, the International Office at the Faculty of Engineering (<http://www.tf.fau.eu/the-faculty/international-office.shtml>) and the Central Office for International Affairs (RIA) (<https://www.fau.eu/international/central-office-for-international-affairs/>) are available to answer any questions that international students may have.

#### University services

The Student Advice and Career Service (IBZ) is the University's main point of contact for students in all questions regarding degree programmes, admission regulations, and application procedures, as well as course schedules and examinations.

The Career Service supports both students and graduates in planning and managing their career with a wide variety of professional cross-faculty events and counselling.

In addition to its excellent teaching facilities, the University has many features which enrich student life.

FAU has cafeterias, German and other language courses, sports facilities (including facilities for sailing and climbing), an orchestra and choir, various libraries, student councils, a buddy programme, and cultural events. All this and more means you are sure to find everything you need while you are studying in Erlangen!

#### Academic calendar

Winter semester: 1 October to 31 March  
Lecture period: mid-October to mid-February  
Summer semester: 1 April to 30 September  
Lecture period: mid-April to mid-July



## The Nuremberg Metropolitan Region



Images: FAU (links), Uwe Niklas (rechts)

FAU is located in southeast Germany at the heart of the Nuremberg Metropolitan Region, one of Germany's most dynamic economic areas with over 3.5 million inhabitants. At the forefront of research, the University contributes to identifying and solving technological, social and cultural challenges.

The Faculty of Engineering is situated in the south of Erlangen, a city with about 100,000 residents. Its baroque city centre was built around a Margrave's residence with an extensive garden which is now home to the university administration.

Nuremberg, which has a population of half a million, has a castle and a city wall which together are considered one of Europe's greatest medieval defence systems.

### Culture

A wide variety of cultural events are offered at numerous cinemas, theatres and the town hall in Erlangen, e.g. the biennial Comic Salon, the Long Night of Sciences with a huge programme of lectures and shows throughout Erlangen, Fürth and Nuremberg, and, of course, the beautiful Schlossgartenfest, the University's annual black-tie event. At Whitsun the famous Bergkirchweih beer festival attracts thousands of people with music and entertainment.

Thanks to its greater size and its historical background, Nuremberg has even more to offer. The castle above the historic city centre, the theatre, the opera house and the Germanisches Nationalmuseum are always worth a visit. Some of the major annual events in Nuremberg include

the internationally famous Rock im Park music festival, the Blue Night with its wide variety of music, cabaret and arts, the Tucher Knight Games in the historical moat, and of course the world famous Christmas market which is held during Advent.

### Leisure

Sports clubs, swimming pools, tennis and squash courts, and other sports facilities provide plenty of possible leisure activities. The University offers its own university sports and music programme for all students and staff. Furthermore, the cities of Erlangen and Nuremberg with their bars, clubs and shopping centres cater for the social side of student life.

### Transport

The preferred form of transport in Erlangen is the bicycle and has attracted many fans in this flat, bike-friendly town. However, there is also a very good public transport network.

### Surrounding area

Situated to the south of Erlangen and Nuremberg is the Franconian Lake District where there are many opportunities for water sports enthusiasts. To the north is the city of Bamberg, a UNESCO World Heritage Site. Finally, the scenic region northeast of Erlangen known as Franconian Switzerland is a great place to go hiking, climbing, and canoeing, and has many beer gardens.



Image: Alexander Kirch/Shutterstock.com

## The best career opportunities – in the region and everywhere else

FAU is firmly rooted in the Nuremberg Metropolitan Region, where it is an important partner for companies, industry, politics, culture, and society. FAU graduates profit from the Metropolitan Region's perfect conditions for starting their professional or academic career.

### Key aspects

The biggest strengths of the Metropolitan Region are transport and logistics, information and communication, medicine and pharmaceuticals, energy, power electronics and environment, new materials, automation technology, and innovative services. Branches of all big banks and insurance companies are located in the region. Some of the large resident companies in Nuremberg and Erlangen are Adidas, Alcatel-Lucent, Areva, Bosch, DATEV, Diehl, Faber-Castell, INA-Schaeffler, LEONI, MAN, Nestlé Schöller, Novartis Pharma, Puma, Schwan-Stabilo, and Siemens. There are also numerous small and medium-sized businesses, for example in health technology, that offer a variety of professional prospects in the region.

### Collaboration

FAU's co-operation partners include globally operating companies such as Siemens, Audi, and Adidas, to name only three. Collaborations

with regional and national companies from all lines of business allow for a direct transfer of research results. Subject-specific placements, theses and student jobs with companies allow FAU students to gain insight into different occupational fields as well as important practical experience. This is why the superbly qualified graduates of FAU are sought-after employees both in Germany and abroad.

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