

UNIVERSITY & SURROUNDINGS

Faculty of Engineering



The Friedrich-Alexander-University Erlangen-Nürnberg (FAU) consists of five faculties with the Faculty of Engineering being the largest. Within the 40+ years of its existence, the faculty has earned an excellent reputation for cutting-edge research and high-quality education. Currently, 20 degree programmes are offered, several of them taught in English. As part of a global network of leading universities, research institutions, and high-tech industry, the Faculty of Engineering can offer its students many opportunities to become part of the international scientific community and to establish links to industry.

Facts and figures about FAU Winter Semester (2015/2016)

- 40,174 students, including 4,341 from abroad
- 258 degree programmes
- 5 elite master's programmes in the framework of the Elite Network of Bavaria
- 500 international university partnerships in more than 70 countries

Facts and figures about the Faculty of Engineering (Winter Semester 2015/16)

- 11,120 students, including 1,727 from abroad
- 59 degree programmes
- 3 elite master's programmes in the framework of the Elite Network of Bavaria
- 218 co-operations in 48 countries

Erlangen and the Local Area

Erlangen, a cosmopolitan and lively student town belongs to the dynamic Nuremberg metropolitan area. With its 100,000 inhabitants (1/3 of them being students) Erlangen provides the perfect environment for living and studying. Erlangen's best known and most loved attraction is the "Bergkirchweih", a beer festival in spring, which attracts around 1 million visitors from near and far. For more information about the region see: www.erlangen.de, www.metropolregionnuernberg.de

INFORMATION



Contact	MAP Chairs Prof. Dr. Erik Bitzek Prof. Dr. Nicolas Vogel	MAP Coordinators Katrin Bartels, B.A. M.A. Claudia Bayer, B.A. M.Sc.
Phone	+49 9131 - 85 28619	+49 9131 - 85 28620
E-mail	map-chairs@fau.de	map-applications@fau.de
Address	second floor Haberstraße 2, 91058 Erlangen	
Website	www.elite-map.tf.fau.de	



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Location



To reach us by plane, car, train or bus, please visit:
www.tf.fau.de/infocenter/campussuche



Elite Master's Programme

Advanced Materials and Processes (MAP)



www.elite-map.tf.fau.de

AREA OF STUDIES

What is "Advanced Materials and Processes"

"Advanced Materials and Processes" (MAP) is a unique and interdisciplinary, international English-taught programme, leading to the degree of "Masters 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.

At the heart of the MAP programme is a unique combination of chemical and biological engineering with materials science and engineering. By providing students with a cutting edge education in both of these fields, 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 specializing in two from the second semester onwards:

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

These focal subjects aim to synergize advanced materials and processes in key technology areas. 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 embedded into the Faculty of Engineering of the FAU and is greatly enriched by the direct involvement of the partner universities of Bayreuth and Würzburg. Local research centers like the Fraunhofer Institute for Integrated Systems and Device Technology (IISB), the Max Planck Institute for the Science of Light, and the Helmholtz Institute for Renewable Energy Production as well as the Cluster of Excellence "Engineering of Advanced Materials" are also directly involved in MAP.

Erlangen is a buoyant student town located in the Nuremberg metropolitan region (3.5 mio. inhabitants), the "home for creative minds", which combines tradition, culture and groundbreaking science and technology. Well-known global players as well as many internationally operating medium-sized companies are based here, providing plenty of job and internship opportunities.

PROGRAMME INFORMATION

Application and Admission

1. Excellent Bachelor's Degree in MAP-related subject required
2. Applicants should belong to the top 10-15% of their year group, as documented by their respective national grades
3. English proficiency demonstrated through a high TOEFL (or equivalent) score
4. Start of studies: Winter semester
5. Application deadline: citizens of non-EU countries: 31 March
citizens of EU countries: 15 July
6. Detailed information about the application procedure can be found on the website www.elite-map.tf.fau.de

Prerequisites and Programme Structure

Expected BACHELOR major:

Materials Science and Engineering, Chemical and Biological Engineering; Life Science Engineering, Nanotechnology, Polymer Engineering, Chemistry, Physics, or related subjects

Degree of Graduation: **Bachelor of Science (B.Sc.) / Bachelor of Engineering (B.Eng.) / Bachelor of Technology (B.Tech.) or equivalent**

M.Sc. (hons) "Advanced Materials and Processes", 4 Semester

Semester 1: Interdisciplinary foundation: depending on their background, students study the fundamentals in materials science and engineering and/or chemical and biological engineering in an individually tailored curriculum, which includes a practical element. In addition, "Basics" classes for all MAP-students introduce them to the four focal subjects. Soft skills courses which include the craft of research and technical writing, rhetoric and intercultural skills complete the curriculum.

Semester 2: Continuation of "Basics" classes; In addition, students focus on two of the four focal subjects and enter the research labs for the first time for their miniprojects. Further soft skills courses in economics, management and personal development and an excursion to several companies or institutes are offered.

Semester 3: Further lectures in the students' chosen focal subjects. The remaining time of the semester is reserved for miniprojects and soft skills courses. Following the third semester's lecture period, the students complete a minimum 12-week industrial internship.

Semester 4: The final stage of the MAP programme is a 6-month project, leading to a Master's thesis.

ELITE M.SC. (HONS) PROGRAMME "ADVANCED MATERIALS AND PROCESSES"

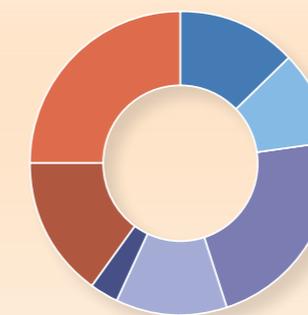
Programme Structure

Semester 1	Semester 2	Semester 3	Semester 4
Fundamentals in Materials Science and Engineering and/or Chemical and Biological Engineering	Focal Subjects	Focal Subjects	Master's Thesis
Lectures introducing focal subjects	Lectures introducing focal subjects		
Practical Course	Miniprojects	Miniprojects	
Soft Skills	Soft Skills	Soft Skills Internship	

The development of advanced materials and processes is widely regarded as a key response to the challenges of the 21st century including climate change, disease control and securing the supply of clean water, food and energy. Nanotechnology, micro- and nanoelectronics, photonics and biotechnology are the main driving forces in the development of tomorrow's products and services. Innovative materials and production concepts are an integral part in all these technologies, and materials science and engineering together with chemical and biological engineering play a fundamental role in enabling new developments in these fields. Novel materials with improved properties or new functionalities will require economically and environmentally sustainable production processes. The Elite Master's Programme in Advanced Materials and Processes (MAP) is training the next generation of engineers with exactly this philosophy in mind. With a curriculum contributed by the Departments of Chemical and Biological Engineering, and Materials Science and Engineering, MAP offers an individually tailored study plan that quickly familiarizes graduates from one discipline with the fundamentals of the other.

Alongside lectures and lab courses, students gain hands on experience through miniprojects, short research projects which introduce students to diverse fields, and then during a 6-month full-time Master's project. The small class size allows for an intensive learning environment and one-to-one academic counselling by the

ECTS Distribution in Master's Programme



Lectures and Courses

- Fundamentals
- Basics
- Focal Subjects
- Soft Skills
- Practical course

Research

- Miniprojects
- Master's Thesis

programme faculty as well as goal orientated coursework, including literature reviews, lecturing training, and poster presentations. A 12-week industrial internship is an integral part of the master's programme and promotes the establishment of direct contacts to industry in Germany or abroad. Alongside academic courses, the programme offers a wealth of soft skills seminars and excursions.

A whole range of institutions are involved in MAP. Besides by the FAU, lectures and research opportunities are also provided by the partner universities in Bayreuth and Würzburg. A particular strength of the programme is furthermore the strong link with the Cluster of Excellence "Engineering of Advanced Materials" and its graduate school, of which MAP students can become junior members, a first step towards a possible PhD.

FURTHER INFORMATION

Career Prospects

The MAP programme prides itself in the academic and professional development of its students through a unique combination of lectures and tutorials, research projects and transferable soft skills courses. MAP graduates are successful both in industry and research. A high percentage of MAP graduates pursue a PhD, many of them in Erlangen or at one of the MAP partner universities. Recent graduates have also secured PhD positions at other world-class universities and research institutes including University of Cambridge (UK), University of California at San Diego (USA), Washington State University (USA), McGill University (CDN), McMaster University (CDN), ETH Zürich (CH) and AMOLF Amsterdam (NL).

MAP does not only train excellent academic researchers. Due to their broad background in materials science and engineering as well as in process engineering, and their specific expertise in their focal subjects, MAP graduates are also highly sought after by industry. Soft skills courses like in industrial project management further contribute to the success of graduates. Typical industry destinations include the energy sector, aerospace, automotive, oil and gas, water treatment, food and drink, health and safety, and building technology (e.g. Bosch, Daimler, Saint-Gobain, BASF).

Support

- We are able to award a limited number of merit-based **MAP-scholarships**. Further financial support, in addition to e.g. DAAD grants, can be obtained by working as a student research assistant, positions being widely available in the Faculty of Engineering.
- **MAP educational grants:** Students can apply for support in order to attend external events (language classes, workshops, conferences etc.) which supplement the course's academic and professional training programme.
- MAP is a highly selective course with a limited class size. With a very **low student to faculty ratio**, MAP students are well cared for, both academically and pastorally.
- The MAP programme is academically directed by **two programme chairs** and representatives of the four focal subjects. MAP is administratively organized by a **dedicated programme office**.
- The **programme office provides** information e.g. on visa procedures, living and studying in Erlangen for international students before coming to Erlangen. For all current MAP-students, the office timetables lectures, practical courses and soft skills courses, administers exams and provides pastoral support.