UNIVERSITY & SURROUNDINGS

Faculty of Engineering



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The Friederich-Alexander-Universität 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 (2017/2018)

> 40,000 students

· 263 degree programmes

· 6 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 2017/18)

> 11,000 students

· 31 degree programmes

· 4 elite master's programmes in the framework of the Elite Network of Bavaria

> 200 co-operations in more than 50 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

map advanced materials and processes

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Location

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

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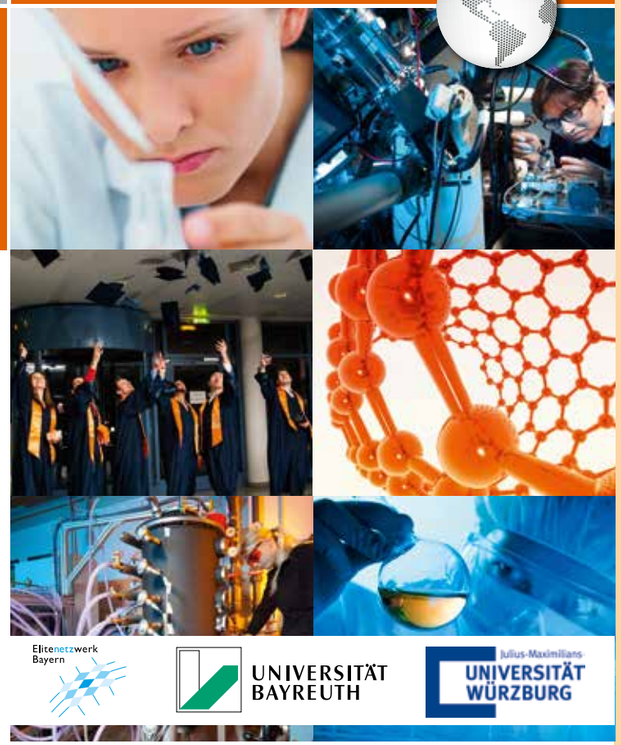
FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG
TECHNISCHE FAKULTÄT

Elite Master's Programme

Advanced Materials and Processes (MAP)



Elitenetzwerk Bayern
UNIVERSITÄT BAYREUTH
Julius-Maximilians UNIVERSITÄT WÜRZBURG

www.map.tf.fau.de

AREA OF STUDIES

Advanced Materials and Processes (MAP) An Elite Master's Programme

MAP is a combination of Materials Science and Engineering with Chemical and Biological Engineering. These disciplines play a key role in the development of novel technologies – without new materials, a great range of key inventions from digital computers or jet engines to customized medical implants would not have been possible. Novel materials with new functionalities or improved properties, however, require specifically designed, economically and environmentally sustainable production processes – which might themselves depend on the development of new catalyst materials. This intimate connection between processes and materials is of key importance for advances and innovations in virtually any field of technology. Chemical and Biological Engineering and Materials Science and Engineering are thus highly intertwined fields, which are, however, traditionally treated as separate subjects.

MAP is an English-taught interdisciplinary Master's Programme and provides a unique curriculum for the next generation of engineers. Students follow an individually tailored curriculum to learn in small groups the fundamentals of Chemical and Biological Engineering and/or Materials science and Engineering. Four focal subjects allow the students to further deepen their knowledge in key technological areas:

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

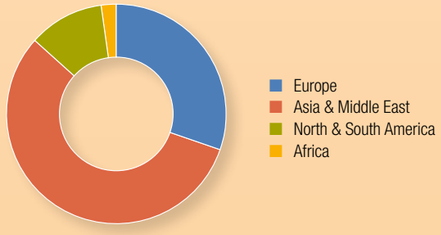
MAP is a highly-selective, accredited 2-year Master's Programme and is part of the Elite Network of Bavaria (ENB). It is characterized by a very low student-to-faculty ratio, early involvement in cutting-edge research through mini-projects and literature reviews, special events such as summer schools and workshops (as well as events organized by the ENB), the availability of educational grants and personal support from the MAP team. Furthermore, students can gain additional qualifications for an academic career or for a career in industry through specialized modules with extra credits.

MAP PROGRAMME

Application and Admission

1. Applicants are required to have an excellent Bachelor's degree in **Chemical and Biological Engineering, Materials Science and Engineering** or related subjects.
2. A very good command of the English language is to be demonstrated via a minimum score of 85 points in the Test of English as a Foreign Language **(TOEFL)** (or equivalent), e.g. at least B2 level of the Common European Framework of Reference **(CEFR)** for Languages.
3. Studies begin in the winter semester (mid-October).
4. Deadline for application: 31 March (Non-EU Citizens), 15 July (EU Citizens).
5. Further information regarding the application procedure is found on the website www.map.tf.fau.de.

Origin of MAP Students (2005-2017):



Scientific 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 centres such as the Fraunhofer Institute for Integrated Systems and Device Technology (IISB), the Max Planck Institute for the Science of Light, the Helmholtz Institute for Renewable Energy Production (HI-ERN), the Institute of Advanced Materials and Processes (ZMP), the Neue Materialien Fürth GmbH (NMF), the Erlangen Catalysis Resource Center (ECRC) and Energy Campus Nürnberg complement the unique research environment in materials and processes.
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 ground-breaking science and technology. Well-known global players such as Siemens and Adidas, as well as many specialised small and medium-sized companies and dynamic start-ups provide plenty of job and internship opportunities.

ELITE MASTER'S PROGRAMME ADVANCED MATERIALS AND PROCESSES (MAP)

Programme Structure

The core MAP programme is designed as a 4 semester Master course with the following general structure and semester content. Optional additional qualifications provide the opportunity to gain competences with a focus on research or industry. These additional qualifications consist of courses with a total of 30 ECTS points and will be certified on the graduation documents.

Core MAP Programme

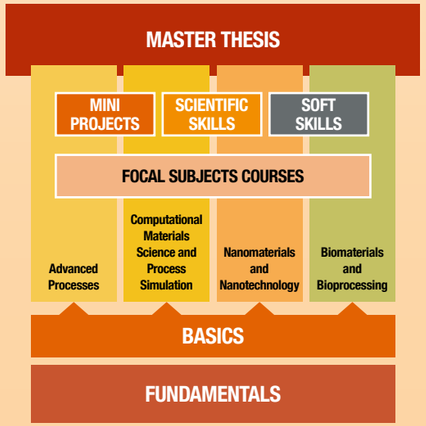
Semester 1	Semester 2	Semester 3	Semester 4
Fundamentals in Material Science and Engineering and/or Chemical and Biological Engineering (20ECTS)	Focal Subjects (15 ECTS)	Focal Subjects (15 ECTS)	Master Thesis (30ECTS)
Lectures covering the Basics of the Focal Subjects (10 ECTS)	Lectures covering the Basics of the Focal Subjects (10 ECTS)	Miniproject (10 ECTS)	
Lab Course (2,5 ECTS)	Soft Skills (2,5 ECTS)	Literature Research (2,5 ECTS)	
		Soft Skills (2,5 ECTS)	

The content of the individual semesters is described in detail on the website www.map.tf.fau.de.

Structure of the additional qualifications; Internship in either research or industry

Semester 1	Semester 2	Semester 3	Semester 4
	Elective course (5 ECTS)	Miniprojects 2 (10 ECTS)	
	Soft Skills (5 ECTS)		
		Internship (10 ECTS)	

The structure of MAP combines core knowledge in Materials Science and Engineering as well as Chemical and Biological Engineering with more advanced courses in the four focal topics. The core knowledge is taught via Fundamentals lectures, while the focal topics are introduced via Basics lectures to provide an overview of the subjects. Each student specializes in two out of four focal topics. The curriculum is complemented by soft skills, scientific skills and a miniproject, where students get first-hand experience with research at the involved institutes. The programme ends with a Master thesis as an independent research project.



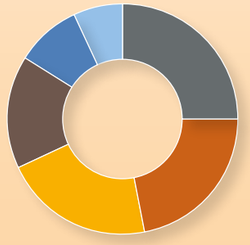
Added value of the English language elite M.Sc. Advanced Materials and Processes

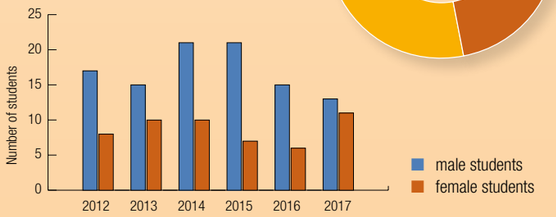
The international, English language elite course "Advanced Materials and Processes" uniquely combines content from materials sciences and chemistry and bioengineering, thus placing it within the FAU's research focus on "New Materials and Processes". In addition to the interdisciplinary nature and the English language, the competitive selection process, individually tailored curricula and mentoring, as well as soft skill courses, innovative teaching concepts and early active involvement in research combine to form a unique study experience. Furthermore, through the partnership with the Universität Bayreuth and the Julius-Maximilians-Universität Würzburg, as well as the active membership in the Elite Network of Bavaria, MAP is thoroughly embedded in the regional academic network.

FURTHER INFORMATION

Career Prospects

Approx. **60%** of **MAP graduates** start a PhD following completion of the programme. Many of these choose to remain in Erlangen or one of the MAP partner universities. Others secure PhD positions at other world-class universities and institutions. MAP, however, does not only train outstanding academic researchers. Many of our graduates find excellent positions in industry, with typical destinations including the automotive, aerospace, oil and gas, food technology, health and safety and pharmaceutical sectors.





Support

- A limited number of merit-based **MAP-scholarships** can be applied for. Additional scholarships are available via, for example, DAAD. Furthermore, remunerated positions as student research assistants are available at the Faculty of Engineering.
- Students can apply for **MAP educational grants** to support attendance of external events (German language classes, workshops, scientific conferences, etc.).
- **MAP** students receive intensive mentoring from the two programme chairs and representatives of the four focal subject heads.
- The **MAP programme office assists** with all tasks pertaining to relocation and life in Germany, including visa procedures.
- The **MAP programme office schedules** lectures, practical courses and tailored soft skills courses, and provides guidance and general support for all current MAP-students.