

# Smart Systems

Hochschule Furtwangen (HFU)  
Master of Science



Overall

## Smart Systems: the technology of the future!

Modern technology, whether in the automotive industry or the fields of aviation or telecommunications, requires the interaction of various areas of expertise. Smart Systems combines the areas of electronics, microsystem technology and technical computer science. Graduates in any one of these fields are in high demand. However, the management of development projects and production processes involving Smart Systems requires graduates who are competent in several of these fields, and have the knowledge and the skills to master their interactions and interfaces.

The **Master of Science Programme in Smart Systems** closely follows this technology trend. Specialised lectures, laboratory work and projects in each of the disciplines electronics, microsystem technology and technical computer science as well as a thorough introduction to the "system concept" (the whole is more than the sum of its parts) constitute the approach behind this contemporary postgraduate programme.

More course details>Three semester graduate courseThe Master of Science Programme in Smart Systems (SMA) is a three semester graduate course for students with a bachelor's degree in a related field. The programme is open to international students. Acceptance into the programme is subject to an assessment and an admissions procedure.

**Requirements:** Professional degree from an academic institution or similar. Good language skills in English, basic language skills in German.

**Length of programme:** The programme lasts three semesters.



### Contact

**Application advisor**  
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Engineering?  
Campus Furtwangen

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[To website >](#)

### Courses

#### Curriculum

The courses in the Master of Science Programme SMA are drawn from the following fields:

- Microelectronics
- Measurement technology
- Advanced feedback control
- Embedded systems
- Signal processing

- Characterisation technology
- Hardware / software code design
- Hardware-based programming
- Semi-conductor devices
- Simulation
- Electrodynamics
- Mathematics
- IC and MEMS-technology
- Microsensors
- IC design

SMA students specialise in one of the following areas

#### **Microsystems Engineering**

This specialisation focuses on the design, development and realization of miniaturized systems. Microsystems (MEMS) integrate electrical and non-electrical functions in one system. Due to the interdisciplinary approach, geared towards students with a background in electrical engineering, electronics, control, mechatronics or even physics engineering. Students are given the opportunity to participate in ground-breaking research.

#### **Electrical Engineering**

Students choosing this specialisation should already have a solid background in electrical engineering. Students in this group deepen their knowledge of electronics and electrical engineering and obtain additional skills in technical computer science.

#### **Computer Engineering**

The specialisation in computer engineering is designed for students with a strong computer science background. Students in this group deepen their knowledge of technical computer science and supplement it with training in electronics.

### Programm Structure

#### The Programm

##### **Semester 1 and 2:**

- Theory and Modelling (12 ECTS Points)
- Modules the selected key area Microsystems Engineering Electrical Engineering Computer Engineering (33 ECTS Points)
- Research Methodology (9 ECTS Points)
- Electives (6 ECTS Points)

##### **Semester 3:**

- Thesis

[Flyer zum Studiengang \(PDF\) >](#)

### Perspectives

#### Career Profile / Opportunities

Qualified for first-rate opportunities and high achievement Smart Systems are implemented in all areas of industry and consumer electronics. For example, they are increasingly used in industrial manufacturing, in the automotive industry, in medical technology and in the IT-communications industry. Our graduates have career opportunities as development engineers, system designers or consultants among others. The programme qualifies them for innovation, research and development in all of the above-mentioned fields as well as in related areas in industry and public research institutes. It is possible for SMA graduates to enter the Ph.D. programme "Generating Mechanisms in Microstructures" offered in cooperation with the University of Freiburg. Especially the south-west-region of Germany, including Furtwangen, stands out due to its excellent career opportunities for engineers in one of its many companies in the microsystem industry.

### Application

#### Facts & Figures

**Degree:** Master of Science

**Number of semesters:** 3 Semesters

**Campus:** Furtwangen in the Black Forest, Germany

**Programme begin:** winter and summer semester

**Language:** English and German

**Application deadline:**

EU students:

- Summer semester 15 January
- Winter semester 15 July

Non-EU students:

- Winter semester 15 May

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Informatik