Master of Science
Embedded Systems Engineering

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Faculty of Engineering
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Overview

- The Faculty of Engineering
- Embedded Systems as a study course
- The Master study program ESE
- Conditional admission – what to do?
- Contact points and helpful persons

- Administrative tips and tricks with Ms. Nopper
The Faculty of Engineering

- Founded in 1995
- Faculty of Engineering consists of
  - Department of Computer Science
  - Department of Microsystems Engineering
  - Department of Sustainable Systems Engineering (founded 2015)
- More than
  - 50 professors & group leaders
  - more than 450 employees,
  - more than 1800 students
    (about 18% female, 37% international)
Embedded Systems at the Faculty of Engineering

- Embedded Systems Engineering (ESE) touches all of our core competencies
- Cooperation of professors and lecturers from the departments of Computer Science (CS) and Microsystems Engineering (MSE) as well as external experts
What is special @ the Faculty of Engineering?

- Unique combination of Computer Science and MSE
- Interdisciplinary study program
- Great infrastructure: cleanrooms, laboratories, computer pools, WiFi, tele-teaching facilities, engineering library
- Close contact to
  - Faculties of Biology, Chemistry, Medical Science, Physics, Materials Science
  - Uniklinik (University hospital Freiburg)
  - 5 local Fraunhofer Institutes
  - Industrial enterprises
- Numerous contacts to the industry
Application areas for Embedded Systems

- Automotive engineering
- Bio/Medical technology
- Smart homes
- Telecommunications
- Media and consumer electronics
- Controlling and regulation in manufacturing processes
- Aerospace …
The Master’s program ESE

- Mandatory course modules assure subject-specific foundations in various areas
- Bilingual study program:
  - lots of courses in English
  - some specific courses in German only
- A big variety of elective courses offers you high flexibility
- Concentration areas and a Personal Profile allow for individual specialization
Mandatory Courses

Specific courses

- Cyber Physical Systems – Discrete Models (Engl.)
- Sensorik und Aktorik (Ger.) / Sensors (Engl.)
- Aufbau- und Verbindungstechnik (Ger.) / Assembly and Packaging Technology (Engl.)
- Micro electronics (Engl.)
- Modelling and system identification (Engl.) (=Modellbildung und Systemidentifikation)

Plus

- One out of six so-called Key courses (Kursvorlesungen) in Computer Science
- One other Key course or one Specialization course in Computer Science
Structure of the study program  
(when starting in winter term)

<table>
<thead>
<tr>
<th>Module / Area</th>
<th>Semester</th>
<th>ECTS credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyber Physical Systems – Discrete Models (English)</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Sensorik und Aktorik (German) [alternative: Sensors (English)]</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Aufbau- und Verbindungstechnik (German) / Assembly and Packaging Technology (English)</td>
<td>1 / 2</td>
<td>5</td>
</tr>
<tr>
<td>Micro-electronics (English)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Modelling and system identification (English)</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Kursvorlesung Informatik</td>
<td>1 or 2</td>
<td>6</td>
</tr>
<tr>
<td>Kurs- oder Spezialvorlesung der Informatik</td>
<td>1 or 2</td>
<td>6</td>
</tr>
<tr>
<td>Concentrations area 1</td>
<td>2 and 3</td>
<td>At least 15</td>
</tr>
<tr>
<td>Concentrations area 2</td>
<td>2 and 3</td>
<td>At least 15</td>
</tr>
<tr>
<td>Personal Profile</td>
<td>2 and 3</td>
<td>At least 15</td>
</tr>
<tr>
<td>Master thesis + presentation</td>
<td>4</td>
<td>27 + 3</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td></td>
<td>120</td>
</tr>
</tbody>
</table>

At least 51 overall
Concentrations and Personal Profile

Concentration areas

- Sensors and Actuators
- Design and Simulation
- Circuits and Systems
- Reliable Embedded Systems
- Distributed Systems
- Robotics and Computer Vision

Select one = Concentration 1 (at least 15 ECTS)

Personal Profile (at least 15 ECTS)

Select one = Concentration 2 (at least 15 ECTS)

At least 51 ECTS
Elective areas: general rules

- You have to complete courses amounting to \textbf{at least} 51 ECTS credits.
- You have to select 2 Concentration areas.
- You have to complete courses amounting to at least 15 ECTS credits in \textbf{each} of your Concentration areas and your Personal Profile.
- You may take at most 2 seminars overall (Concentration areas + Personal Profile).
You can select from

- all *lectures, seminars or lab courses*
  from the Master’s programs for
  - MSE or MST
  - Computer Science

@ the Faculty of Engineering
Conditional admission –
What does this mean for me?

- Conditions have to be fulfilled in addition to the normal Master‘s curriculum
  → likely to extend the time you need to graduate

- You have to complete the required modules by the end of the second semester.
  They should be your top priorities!

- You will be automatically registered for these courses, but have to register for the exams yourself
  → Registration for these exams have to be done via PDF form:
  https://www.tf.uni-freiburg.de/de/studium-lehre/a-bis-z-studium/dokumente/Examregistration.pdf
Conditional admission – What does this mean for me?

- It is not sufficient to take the exam, you have to attend the course.
- If the lecturer requires any exercises or mid-term exams for admission to the final exam, you also have to fulfill these requirements.
- Exams required for conditional admission can only be repeated once (if failed).
- If a conditional course collides with one of your mandatory or elective courses, the conditional course should always have higher priority!
- Some conditional courses can be switched with their language counterpart (obviously you should know the language well enough, if doing this):
  - MST Bauelemente and MS Technologies and Processes
  - Sensors and Sensorik/Aktorik
Some words on intellectual honesty

- Intellectual honesty is important: You don’t want someone (your co-workers?) to steal your work, so do not do it yourself!
- Do not falsify any results, either.
- Some well-known persons in Germany have fallen prey to plagiarism some years ago → correct quoting is crucial!
- Severe consequences if you get caught! (Failing the course or, if done repeatedly, expulsion possible!)
Problems with your studies?

- If you have any questions or problems: Act immediately and do not procrastinate!

- Contacts & info sources:
  - Official information sources by university, faculty and study program
  - Academic advising
  - Lecturers / assistants /mentors (face-to-face or via e-mail)
  - Fachschaft (departmental student committee)
  - Information centers like the Student Service Center, Office of Student Services etc.
  - Fellow students
Contact information:

- Martina Nopper  
  (mainly Computer Science)  
  Bld. 101, room 02-013a  
  Phone: +49 (0) 761 / 203 – 8169

- Frank Goldschmidtböing  
  (mainly MSE)  
  Bld. 102, room 01 075  
  Phone: +49 (0) 761 / 203 – 7496

- E-mail:  
  studienberatung@ese.uni-freiburg.de  
  https://www.tf.uni-freiburg.de/en/study-programs/counseling

→ Academic Advising ESE
Further contact points at our faculty

- **Examination Office**
  - Susanne Stork & Anne-Julchen Müller
  - [https://www.tf.uni-freiburg.de/en/study-programs/counseling](https://www.tf.uni-freiburg.de/en/study-programs/counseling)
  → Examinations Office Faculty of Engineering

- **Student Advising on general matters**
  - Ursula Epe
  - [https://www.tf.uni-freiburg.de/en/study-programs/counseling](https://www.tf.uni-freiburg.de/en/study-programs/counseling)
  → Program coordination and general study advice

- **Fachschaft: (departmental student committee)**
  - [http://fachschaft.informatik.uni-freiburg.de](http://fachschaft.informatik.uni-freiburg.de)
And after graduation?

- What could you do after you achieved your Master‘s Degree?
  - Working in various companies
  - Doing your PhD / Working on a research project
  - ……
  - …
Now good luck from my side and have fun with your studies!