M.Sc. Microsystems Engineering

Introduction

Faculty of Engineering
IMTEK
Svenja Andresen, Programme Coordinator
Freiburg, 12/10/2023
About me

Svenja Andresen

- Programme Coordinator for Microsystems Engineering
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Consulting hours via phone: **Tuesday & Thursday 9:30-11:30**, on site/via Zoom: **best by prior appointment**

More info on consulting hours and changes:
https://www.tf.uni-freiburg.de/de/studienangebot/studienberatung
Academic Advisors

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- Phone: +49 761 203 7164

E-Mail: studienberatung@imtek.de
Agenda

1. Organization
2. Administration
3. Important info and rules regarding exams
4. Where to find information and help
1. Organization
Curriculum
Some important terms

Modules  🧪
building blocks of the syllabus
- Consist of various elements (different symbols/icons in study planner)
- Credits are given for the complete module, no „partial credits“

Courses in the MSE program: 📚
- Lectures –Vorlesung(V)
- Exercises –Übung(Ü)
- Lab courses –Praktikum/ Praktische Übung(Pr)
- Seminars –Seminar (S)
Curriculum

Some important terms

Graded assessments or pass/fail:

**Coursework or pass/fail assessments** ("Studienleistungen", SL):
- Part of a module or final assessment
- May be graded, or only “pass” or “fail”
- Not part of the final grade
- No negative consequences if failed (apart from having to repeat → “time penalty”)

**Graded assessments /Exams** ("Prüfungsleistungen", PL):
- Always graded
- Always counts towards the final grade
- Strict rules/regulations and limited number of attempts
**Curriculum Structure**

**Microsystems Engineering (M.Sc.)**

**Compulsory courses (30 ECTS):**
- Microelectronics
- Micro-mechanics
- Microsystems design laboratory
- Microsystems Technologies and Processes
- Signal processing

**Concentration Areas (30 ECTS):**
- Biomedical engineering
- Circuits and systems
- Materials and Fabrication
- Photonics
- Customized Course Selection (i.e. language courses)

**Advanced Microsystems:**
(30 ECTS, 5 out of 8 modules)
- Assembly and Packaging Technology
- Micro-optics
- Modelling and System Identification
- Probability and Statistics
- Sensors
- Biomedical Microsystems
- Micro-actuators
- Micro-fluidics

**Master thesis**
30 ECTS
Curriculum
At a glance…

• 5 Compulsory courses
  30 ECTS
• Advanced Microsystems: 5 out of 8 modules
  30 ECTS
• Concentration Areas
  30 ECTS
• Customized Course Selection
  9 ECTS
• Master’s thesis
  30 ECTS

• You are not allowed to take more courses than necessary to meet these requirements

• In general, you have to plan so you hit the 90 credits exactly
# Mandatory modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Type</th>
<th>Exam</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro-electronics</td>
<td>Le-E</td>
<td>Written exam</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Micro-mechanics</td>
<td>Le+E</td>
<td>Written exam</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>MST Design Laboratory I for Microsystems Engineering</td>
<td>La</td>
<td>Pass/Fail assessment (Studienleistung)</td>
<td>6</td>
<td>1</td>
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<tr>
<td>MST Technologies and Processes</td>
<td>L+E</td>
<td>Pass/Fail assessment (Studienleistung) Written exam</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Signal Processing</td>
<td>L+La</td>
<td>Written exam</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Master’s module</td>
<td></td>
<td>Thesis and presentation</td>
<td>27+3</td>
<td>4</td>
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</table>
## Compulsory elective modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Type</th>
<th>Exam</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly and Packaging Technology</td>
<td>Le+E</td>
<td>Written exam</td>
<td>6</td>
<td>1, 2 or 3</td>
</tr>
<tr>
<td>Mirco-optics</td>
<td>Le+E</td>
<td>Written exam</td>
<td>6</td>
<td>1 or 3</td>
</tr>
<tr>
<td>Modelling and System Identification</td>
<td>Le-E</td>
<td>Written exam</td>
<td>6</td>
<td>1 or 3</td>
</tr>
<tr>
<td>Probability and Statistics</td>
<td>Le-E</td>
<td>Written exam</td>
<td>6</td>
<td>1 or 3</td>
</tr>
<tr>
<td>Sensors</td>
<td>Le+La</td>
<td>Pass/fail assessment</td>
<td>6</td>
<td>1 or 3</td>
</tr>
<tr>
<td>Biomedical Microsystems</td>
<td>Le+E</td>
<td>Written exam</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Micro-actuators</td>
<td>Le+E</td>
<td>Pass/fail assessment</td>
<td>6</td>
<td>2</td>
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<tr>
<td>Micro-fluidics</td>
<td>Le+E</td>
<td>Written exam</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total to be selected</strong></td>
<td></td>
<td></td>
<td><strong>30</strong></td>
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</tr>
</tbody>
</table>
Concentration Areas in Microsystems Engineering

• You choose ONE area

The four concentration areas are:

• Circuits and Systems
• Biomedical Engineering
• Materials and Fabrication
• Photonics
Customized Course Selection

Instead of completing all 30 ECTS from your chosen concentration area, you can earn 9 ECTS in the Customized Course Selection.

Here, you can choose from:

- Courses from the MSE concentrations
- Scientific writing or project management in MSE
- One language course (esp. German courses from SLI for international students) (please note: not from the „Zentrum für Schlüsselqualifikationen“/BOK area)
- Selected courses from other departments /faculties, like from the Economics Department (not in study planner – application required)

Be aware that the rules regarding the Customized Course Selection are different in the ESE study program, when talking to other students or lecturers!
Optional Specialization

You can choose to do a specialization in your study programme (which will be shown on the final documents). There are 4 specializations available:

- Circuits and Systems
- Materials and Fabrication
- Biomedical Engineering
- Photonics

The requirements are:

- You have to take courses with 30 ECTS from the according specialization
- You have to do a Master Thesis with a related topic
Master’s Thesis

- Master thesis (27 ECTS) graded
- Colloquium (= Presentation/ Defense; 3 ECTS) graded

Admission to thesis: you need at least 72 ECTS credits
- Duration: 6 months

2. Administration
Advice and recommendations

- Most courses are offered every other semester (i.e. once a year); some might be held more irregularly; this should be mentioned in the module handbook (please see HISinOne or PDF)

- Overlapping of courses: with the huge amount of courses offered, this unfortunately happens

- Be aware that you might need to adapt your original study plan

- Usually no dependencies regarding order of courses

- However, check with lecturers for appropriate combinations or recommended order of courses

- Most prerequisites stated in the course catalog are recommendations, they are not mandatory, but some are please read the description!
Next steps

• Study the course catalog / planner of studies (What courses are offered right now?)

• Check out a few more courses than you intend to complete in the given semester

• Register (via HISinOne→ “Booking of courses”) for the courses you want to take as soon as possible

• Information on dates and deadlines for course booking:
  https://www.tf.uni-freiburg.de/en/studies-and-teaching/calendar-dates

→ Booking deadlines for Bachelor and Master courses

• Read the official exam regulations! (= terms and conditions of your study program)

A non-binding English translation of the MSE exam regulations can be found here.
Course booking

- Have a look at your planner of studies https://campus.uni-freiburg.de

- If you have questions or made a mistake while booking: Contact Ms. Moses in the Dean's office: moses@tf.uni-freiburg.de or myself (Screenshots are really helpful)

- Booking periods can always be found here: https://www.tf.uni-freiburg.de/en/studies-and-teaching/calendar-dates
- → Booking deadlines and seat allocation for Bachelor and Master courses

- Be aware: Different course types have different deadlines!

- If you forgot to book a course: contact the lecturer and ask if there are still seats available and if it generally makes sense to start late

- The examination office can’t help you with this!

- Please note: Registration for an exam in HISinOne can be confusing if you did not book the course beforehand!
Course booking Wiki/HISinOne Demo

• Login to https://campus.uni-freiburg.de/
## Course booking Wiki/HISinOne Demo

### Planner of studies with Module plan Master of Science, Microsystems Engineering, Hauptfach, PO 2021

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
<th>Semester 3</th>
<th>Semester 4</th>
<th>Semester 5</th>
<th>Semester 6</th>
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<tr>
<td>WIS 2023/24</td>
<td>SS 2024</td>
<td>WIS 2024/25</td>
<td>SS 2026</td>
<td>WIS 2025/26</td>
<td>SS 2026</td>
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<tr>
<td><strong>Micro-electronics</strong></td>
<td><strong>Functional Safety, Security and Sus</strong></td>
<td><strong>Quantification of Resilience</strong></td>
<td><strong>Master’s Modul</strong></td>
<td><strong>Biology for Engineers</strong></td>
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<tr>
<td><strong>MST Design Lab I for Microsystems</strong></td>
<td><strong>Signal processing</strong></td>
<td><strong>Physics of Failure</strong></td>
<td><strong>Advanced Microcontroller Laboratory</strong></td>
<td><strong>Grundlagen der mechanischen War</strong></td>
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<tr>
<td><strong>Micromechanics</strong></td>
<td><strong>Dynamics of Materials: Material Char.</strong></td>
<td><strong>Ausgewählte Problemelemente in I</strong></td>
<td><strong>Nano-Photonics - Optical manipulati</strong></td>
<td><strong>Optische MEMS / Optical MEMS</strong></td>
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<tr>
<td><strong>MST Technologies and Processes</strong></td>
<td><strong>Neuophysiology - Praktikum / Neu</strong></td>
<td><strong>Digital Health (DHI)</strong></td>
<td><strong>Optische MEMS / Optical MEMS</strong></td>
<td></td>
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<td>-3</td>
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<tr>
<td><strong>Micro-optics</strong></td>
<td><strong>Entwurf Analog CMOS Schaltungen</strong></td>
<td><strong>Neuropathology / Neuropsychologies</strong></td>
<td><strong>Optoelektronik / Optoelectronics</strong></td>
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<tr>
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### Albert-Ludwigs-Universität Freiburg | Präsentationstitel | 12. Oktober 2023

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Course booking Wiki/HISinOne Demo
Course booking Wiki/HISinOne Demo Mandatory courses
Course booking Wiki/HISinOne Demo Advanced MSE
Course booking Wiki/HISinOne Demo Concentrations
Course booking Wiki/HISinOne Demo-Customized Course Selection

<table>
<thead>
<tr>
<th>Course Code</th>
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<tr>
<td>11LE50KT-8609-MSc-986-2021</td>
<td>Preliminary average grade M.Sc. Microsystems Engineering (PO-Version 2021)</td>
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<tr>
<td>11LE50KT-0001-MSc-986-2021</td>
<td>ECTS credits account Master of Science in Microsystems Engineering (PO-Version 2021)</td>
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<tr>
<td>11LE50KO-999-MSc-986-2021</td>
<td>Master's Modul</td>
</tr>
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<td>11LE50KO-P-MSc-986-2021</td>
<td>Pflichtbereich / Mandatory Modules M.Sc. Microsystems Engineering (PO 2021)</td>
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<tr>
<td>11LE50KO-MSc-986-2021</td>
<td>Micro-electronics</td>
</tr>
<tr>
<td>11LE50KO-MSc-986-2021</td>
<td>Micromechanics</td>
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<tr>
<td>11LE50KO-MSc-986-2021</td>
<td>M5T Design Lab I for Microsystems Engineering</td>
</tr>
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<td>Signal processing</td>
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<td>11LE50KO-WP-MSc-986-2021 WP1</td>
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<td>11LE50KO-WP-MSc-986-2021 WP2</td>
<td>Concentration Areas</td>
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<td>11LE50KO-WP-MSc-986-2021 WP2 CS</td>
<td>Circuits and Systems</td>
</tr>
<tr>
<td>11LE50KO-WP-MSc-986-2021 WP2 MaF</td>
<td>Materials and Fabrication</td>
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<td>11LE50KO-WP-MSc-986-2021 WP2 BE</td>
<td>Biomedical Engineering</td>
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<tr>
<td>11LE50KO-WP-MSc-986-2021 WP2 P</td>
<td>Photonics</td>
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<td>11LE50KO-WP-MSc-986-2021 CCS</td>
<td>Customized Course Selection</td>
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<tr>
<td>11LE50KO-WP-MSc-986-2021 KT 1</td>
<td>Courses offered by INTEK</td>
</tr>
<tr>
<td>11LE50KO-WP-MSc-986-2021 KT 2</td>
<td>Courses offered by other departments of the University of Freiburg</td>
</tr>
<tr>
<td>11LE50KO-WP-MSc-986-2021 KT 3</td>
<td>Language courses</td>
</tr>
</tbody>
</table>
3. Important info and rules regarding exams

More details will be offered by the examination office team in a presentation in November. You’ll receive an invitation e-mail in due course.
Registration: Exams/Graded Assessments (PL)

This is another, independent step from booking the course. It’s not done automatically.

• The procedure is similar to booking the courses. For a how-to, see https://www.tf.uni-freiburg.de/en/studies-and-teaching/a-to-z-study-faq/examinations

• **Deadlines for the registration** (and de-registration) for exams are also mentioned on this website

• Without registering for an exam you are not allowed to take it, so please **do not forget!**

• To make sure you are correctly registered, we recommend saving/printing the pdf of the registration confirmation in HISinOne ➔ My studies ➔ My course enrollments and exam registrations
How to proceed if you failed an exam

Number of attempts are limited:
- 2 attempts for every exam / graded assessment (if needed)
- 2 oral or written exams can be attempted 3 times

• You are registered automatically for the repetition(s) and cannot sign off.

• Repetition exam will take place in the next semester

• You can substitute 1 course (from Advanced MSE or the concentration) you failed the exam/graded assessment with another one (but it has to be done after the first failed attempt)
Grade improvement

• Repeating an exam that you have passed, to improve your mark, is possible in one module you did in your first year of studies here

• This rule applies only to written or oral exams (not other kinds like homework or presentations)

• You have to take the „repetition“ exam directly in the following semester

• The examination with the better grade will be considered official
Missing an exam: Unexcused or authorized withdrawals

If you do not attend an exam that you registered for, it counts as failed, unless you have a valid excuse

- Valid excuses can be
  - Due to illness → Doctor’s note required, see https://www.tf.uni-freiburg.de/en/studies-and-teaching/a-to-z-study-faq
  - Due to emergencies in family etc. (please contact examination office immediately)
4. Finding information and help
Students are responsible to stay informed

You are independent persons, expected to (mostly) self-organize and self-motivate. There is no service establishment catering to all your needs.

We provide the necessary information through different sources:
- Websites
- Introductory events
- Official documents (like exam regulations)
- Information emails (Make sure to have access to your faculty user account and forward or use that e-mail address!)

Reading is essential! Please read! The whole text, all the lines in an email, the complete instructions in exercise or exam sheet...

„I did not know!“ is not an acceptable excuse!
Information resources

- Faculty of Engineering: https://www.tf.uni-freiburg.de/en/studies-and-teaching

- Calendar, dates and deadlines: https://www.tf.uni-freiburg.de/en/studies-and-teaching/calendar-dates


- Information for new students: https://www.tf.uni-freiburg.de/en/studies-and-teaching/a-to-z-study-faq/freshers-info

- A to Z –Study FAQ https://www.tf.uni-freiburg.de/en/studies-and-teaching/a-to-z-study-faq
When writing an e-mail to an advisor or the examination office…

- Please use a sensible subject
- Assume we do not know you, and we have no supernatural powers. So, please sign the email with your full name; your matriculation number can also be helpful, and it would be great if you mention your study programme
- Use full names of professors, supervisors or lecturers (we are not on first name base with everyone at the faculty)
- For a question about a new topic: Write a new mail and address it (correctly) yourself. Don’t “answer” to older information mails from us
- If it is urgent, indicate this in the subject line! Our responses to mails not classified as urgent can take quite a while and we try to prioritize
If you have any queries or problems: please try to reach out as soon as possible.

- **Contacts & information sources:**
  - Official information sources by university, faculty and study programme
  - Study advisors and programme coordinator - Contact information for advisory services at TF: [https://www.tf.uni-freiburg.de/en/study-programs/counseling](https://www.tf.uni-freiburg.de/en/study-programs/counseling)
  - Mentors
  - Lecturers / assistants (face-to-face or via e-mail)
  - Fachschaft TF (student committee of this faculty)
  - Information centers like the Student Service Center/Central Academic Advising Office, IAS, Office of Student Services, SWFR, Counselling services, Nightline etc.
  - fellow students
What is the Service Center Studium? Everything under one roof

**Zentrale Studienberatung** (Central Academic Advising)
- Information
- Hotline
- Beratung/ Counseling
- Workshops, Events
- Media-Team (OSA, myUFR-App)
- Projects

**Studierendensekretariat** (Registration office)
- Applications/ Admissions (Germans and “Bildungsinländer“)
- Student Administration

**International Admissions and Services**
- Applications/ Admissions Internat. Students
- Student administration
- Intercultural Mentoring
- APIS - Additional Program for Internat. Students

**UniCard office**

**Deutschlandstipendium**

**Scholarship advising**
- FACE: advising on teachers training
- Studying abroad | Erasmus+
- Representative f. Students with a Disability or Chronic Illness
- Federal Employment Agency University Team

SCS – Sedanstr. 6
Whom to ask?

programme-related matters:

**Lecturers/ Professors**
e.g. thematic questions, literature and learning material etc.

**Study coordinators**
e.g. study planning, decisions, setting priorities, examination regulations, credits etc.

general matters:

**International Admissions and Services (in SCS)**
e.g. advice for international students, preliminary certification by the university, issue of certificates for international students, questions about leave of absence and tuition fees etc.

→ www.ias.uni-freiburg.de

**Central Academic Advising (in SCS)**
e.g. motivation, reorientation, decision-making, learning process, study organisation, stress, crises etc.

• confidential, anonymous if necessary, neutral
• If needed, referral to other contact persons (representative for students with chronic illness/disability, employment agency etc.)

→ www.zsb.uni-freiburg.de
What to do when things get stuck?

Trouble shooting

- Confusion, doubt and crises are normal parts of studying: sometimes it's just a brief irritation, sometimes there's more to it than that
- There are many helpful contact persons at the university; the SCS will help directly or find the right places for you
- Take care of a good balance from the beginning (e.g. student health management www.sgm.uni-freiburg.de; workshops by SCS and SWFR)
- If needed, sooner rather than later:
  - ask questions
  - get help
  - try it out
In case of emergency

- emergency call 112
- https://uni-freiburg.de/zuv/service/hilfe-bei-notfaellen/

- Psychotherapeutic Counselling of the „Studierendenwerk“
  www.swfr.de/en, follow „Support“

- In case of urgent crises:
  - Outpatient Clinic of the University Department of Psychiatry and Psychotherapy, Hauptstraße 5, Freiburg Tel: 0761/270-65 500, -65 010, -65 020
  - Emergency practice of the Kassenärztliche Vereinigung BW in the University Hospital, ground floor, Hugstetter Str. 55, Freiburg
    Tel: 116 117 (Mon/Tue/Thu 8 p.m.-6 a.m.; Wed/Fri 4 p.m.-6 a.m.; Sat/Sun/Holiday 24h)
Thank you for your attention. Wishing you a good start and the best of success!

Campus tour is about to begin at 12:15 😊

Source: Liz Fosslien [@lizandmollie]