universität freiburg

M.Sc. Embedded Systems Engineering (ESE)

Administrative information

Usually Martina Nopper (Dipl.Inf.) – due to illness today Ms. Svenja Andresen and Ms. Ursula Epe will be the substitutes
Faculty of Engineering
October 10th, 2024

Programme coordinator and study advisors

- Martina Nopper (Dipl.Inf.)
- Study Advisor for Computer Science and ESE
- Phone: +49 761 203 8169

  Phone Consulting hours: Monday 1:30 – 4 p.m. + Thursday 9:00 – 11:30 a.m.
  More information about consulting (and changes to consulting hours) see here:
  https://www.tf.uni-freiburg.de/en/study-programs/counseling

Counterpart in the MSE Department:

- Frank Goldschmidtböing
- Phone: +49 (0) 761 / 203 – 7496

Mail (*shared!*): studienberatung@ese.uni-freiburg.de

Today I‘ll show you…

1. How to organize your studies
2. Some administrative things
3. Some important rules regarding exams
4. Where you can get information and help

1. Syllabus / Study Plan

Vocabulary you should know… part 1

Modules = building blocks of the syllabus

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

Courses in the ESE programme :

- Lectures – Vorlesung (V)
- Exercises – Übung (Ü)
- Lab courses – Praktikum / Praktische Übung (Pr)
- Seminars – Seminar (S)
- Projects – Projekt (*also* Pr)

Vocabulary you should know… part 2

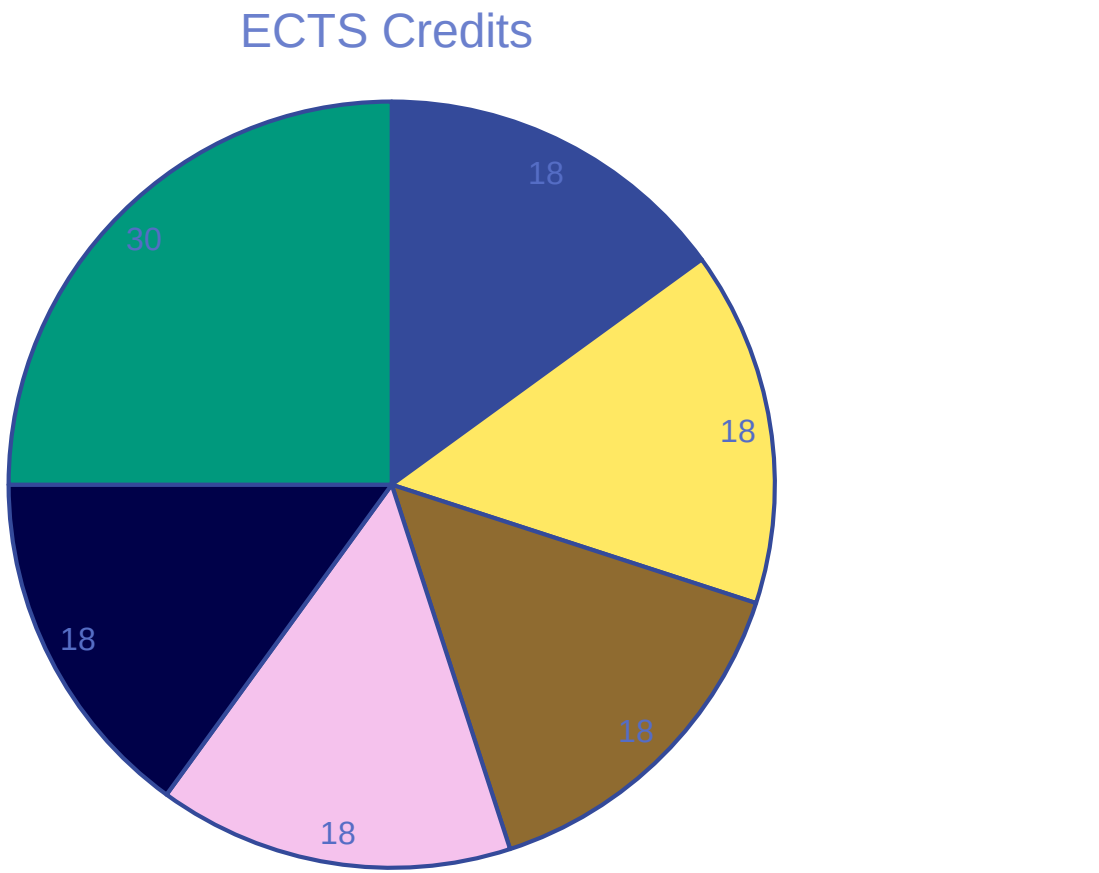
Graded assessments or pass/fail:

- Coursework or pass/fail assessments (“Studienleistungen”, SL)
  - Part of module or final assessment
  - May be graded, or only “pass” or “fail”
  - Not part of the final grade
  - No negative consequences if failed (just might have to be repeated)

- Graded assessments /Exams (“Prüfungsleistungen”, PL)
  - Always graded
  - Always counts into the final grade
  - Strict rules/regulations and very limited number of attempts

Syllabus: General structure by ECTS

120 ECTS Credits overall



Syllabus: Rules

- 4 mandatory areas with 18 ECTS each
  - 2 Computer Science (Essential Lectures in CS + Elective Courses in CS)
  - 2 MSE (Advanced MSE + Concentration Area in MSE)
- Remaining 18 ECTS have to be distributed among
  - Either one or more of the above mentioned areas
  - And/or the Customized Course Selection

    (Note: This is **not** the name for these 18 „flexible“ credits!)
- 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
  (no massive „overshooting“ of credits – this is especially important with projects)

Syllabus: General structure

18 ECTS
(3 lectures)
from
Essential Lectures in Computer Science

18 ECTS
from
Elective Courses in Computer Science
Specialization Courses
(6 ECTS each)
and/or up to
2 Seminars
(3 ECTS each)
or 1 Study project
(18 ECTS)

18 ECTS
(3 lectures)
from
Advanced Micro-systems Engineering (MSE)

18 ECTS
from
one of the
Concen-tration Areas in Micro-systems Engineering

For optional specialization in one of the areas (AI, CPS, Circuits and Systems, Materials and Fabrication, Biomedical Engineering, Photonics):
at least 30 ECTS from according courses (not project) + Master Thesis with related topic

18 „flexible“ ECTS: courses chosen from **one or more of the 4 areas above** *and/or* from the so-called **Customized Course Selection**

30 ECTS Master Thesis + Colloquium

Essential Lectures in Computer Science

Module (take courses up to at least 18 ECTS)	**ECTS**	**Semester** (recommended) when starting in winter semester
Algorithm Theory (course type: advanced lecture)	6	1 or 3
Cyber-Physical Systems – Discrete Models (course type: specialization course)	6	1 or 3
Databases and Information Systems (course type: advanced lecture)	6	1 or 3
Introduction to Embedded Systems (course type: specialization course)	6	1 or 3
Machine Learning (course type: advanced lecture)	6	1 or 3
Computer Architecture (course type: advanced lecture)	6	1 or 3
Foundations of Artificial Intelligence (course type: advanced lecture)	6	2
Image Processing and Computer Graphics (course type: advanced lecture)	6	2
Software Engineering (course type: advanced lecture)	6	2

Elective Courses in Computer Science

You have to take courses up to at least 18 ECTS.
The maximum (if you do not take more than the bare minimum 18 ECTS anywhere else) would be 36 ECTS.

You can choose from

- Specialisation Courses in Computer Science (6 ECTS each)
- *And/or* up to 2 Seminars (3 ECTS each)
- *And/or* 1 Study project (18 ECTS)
  (Please be aware that you cannot surpass the 36 ECTS here or the 90 ECTS overall, so plan carefully if you intend to take the study project!)

Advanced Microsystems Engineering (MSE)

Module (take courses up to at least 18 ECTS)	**ECTS**	**Semester** (recommended) when starting in winter semester
Assembly and Packaging Technology	6	1, 2 or 3
Micro-electronics	6	1 or 3
Micro-mechanics	6	1 or 3
Micro-optics	6	1 or 3
Modelling and System Identification	6	1 or 3
MST Technologies and Processes	6	1 or 3
Sensors	6	1 or 3
Signal Processing	6	2
Probability and Statistics (This **can't** be taken as part of the 18 mandatory credits, only if you opt to do more ECTS in this area!)	6	1 or 3

Concentration Areas in MSE

You have to choose ***one*** area and complete courses up to at least 18 ECTS.
If you choose to take more than this, the surpassing courses can be from another area.
(The maximum would, again, be 36 ECTS, if you do no courses in any other area.)

The 4 Concentration Areas are:

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

Customized Course Selection
What it is:

Instead of completing some or all of the 18 „flexible“ credits by taking courses in one or more of these 4 areas, you can take some courses (max. 18 ECTS) in the so-called Customized Course Selection.

Here, you can choose from

- Pass/fail courses (Studienleistungen) from Computer Science or MSE
  (like lab courses in CS, 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 planner of studies – application to study advisor (me) required)

Customized Course Selection
What it is *not*:

The Customized Course Selection ist NOT the name for the 18 “flexible credits“!

That seems to be a common misunderstanding. But Customized Course Selection is simply the name for these certain pass/fail courses.

So, please don‘t ask the examination office or myself to *„move the MSE concentration course XY“* or *„the lecture YZ from Elective Courses in Computer Science“* **to** the CCS. Because that is **impossible**.
Courses have their defined area(s) and they stay where they are.

Also: Be aware that the rules regarding the Customized Course Selection are different in the MSE study programme, when talking to other students or lecturers!

Master Thesis

- Master thesis (27 ECTS) graded
- Colloquium (= Presentation / Defense) (3 ECTS) graded
- Admission to thesis: at least 72 ECTS credits
  (plus conditional courses from admission, if applicable)
- Duration: 6 months

More information:

https://www.tf.uni-freiburg.de/en/studies-and-teaching/a-to-z-study-faq/thesis

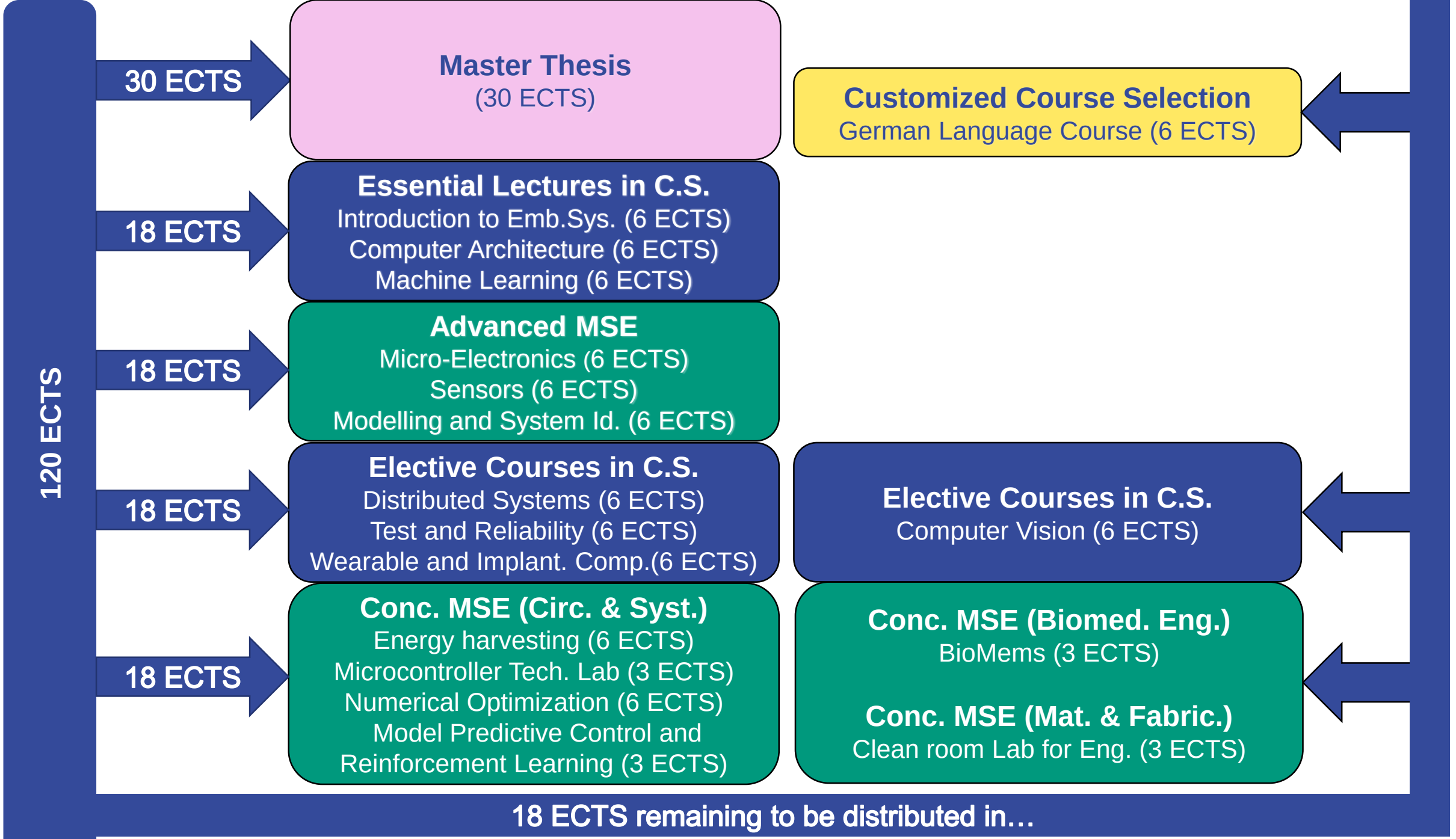
Optional specialization

You can choose to do a specialisation in your study programme (which will be shown on the final documents). There are 6 specialisations available:

- Artificial Intelligence (AI) *(courses see website)*
- Cyber-Physical Systems (CPS) *(courses see website)*
- Circuits and Systems (i.e. the MSE Concentration)
- Materials and Fabrication (i.e. the MSE Concentration)
- Biomedical Engineering (i.e. the MSE Concentration)
- Photonics (i.e. the MSE Concentration)

The requirements are:

- You have to take courses with **at least 30 ECTS** from the according specialisation category
  (please note: study project, seminars or lab courses do not count in Comp.Sc.)
- You have to do a **Master Thesis** with a related topic


120 ECTS
30 ECTS
Master Thesis
(30 ECTS)
Customized Course Selection
German Language Course (6 ECTS)
18 ECTS
Essential Lectures in C.S.
Introduction to Emb.Sys. (6 ECTS)
Computer Architecture (6 ECTS)
Machine Learning (6 ECTS)
18 ECTS
Advanced MSE
Micro-Electronics (6 ECTS)
Sensors (6 ECTS)
Modelling and System Id. (6 ECTS)
18 ECTS
Elective Courses in C.S.
Distributed Systems (6 ECTS)
Test and Reliability (6 ECTS)
Wearable and Implant. Comp.(6 ECTS)
Elective Courses in C.S.
Computer Vision (6 ECTS)
18 ECTS
Conc. MSE (Circ. & Syst.)
Energy harvesting (6 ECTS)
Microcontroller Tech. Lab (3 ECTS)
Numerical Optimization (6 ECTS)
Model Predictive Control and
Reinforcement Learning (3 ECTS)
Conc. MSE (Biomed. Eng.)
BioMems (3 ECTS)
Conc. MSE (Mat. & Fabric.)
Clean room Lab for Eng. (3 ECTS)
18 ECTS remaining to be distributed in…

Administrative things

Some practical advice and general facts

- Most courses are offered every other semester
  (i.e. once a year); some can be held more irregularly → should be mentioned in the module handbook (see HISinOne or PDF)
- Overlapping courses...
  With the amount of courses and the flexible curriculum, this just happens.
  Basically: Find a way to deal with it!
  (Meaning: Choose one course for this semester, do the other one in year;
  or check for lecture recordings, or…)
- Be aware that you might need to adapt your original study plan

Some practical advice and general facts

- Usually no dependencies regarding order of courses
  - Nevertheless, check with lecturers for appropriate combinations or recommended order of courses
- Most prerequisites stated in the course catalog are recommendations, they are not mandatory; well, a few of them are…
  Just read what is said in the description!

Conditional admission: What does this mean?

- Conditions have to be fulfilled in addition to the normal Master‘s curriculum → likely to extend your study time
- You have to complete the required modules by the end of the second semester.
  They should be your top priorities!
  (Especially in case of course collisions/overlaps)

- You will be automatically registered for these courses as well as exams.
  If you should decide not to take the exam in the intended semester (after the course), you have to contact the examination office to de-register.
- Exams required for conditional admission can only be repeated once.

Advice for your 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
  - *Go to the lectures for about 2-3 weeks and then decide, which courses to continue, and de-register from those you don't want to pursue*
- 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 programme)
  https://www.tf.uni-freiburg.de/bilder/studium_lehre/englische-poen/exam-regulations-msc-ese-po-2021

Registering for/ Booking of courses

- Have a look at your **Planner of studies** https://campus.uni-freiburg.de
- Follow instructions from short demonstration here
- 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)

Be aware: Different course types have different deadlines!

(See https://www.tf.uni-freiburg.de/en/studies-and-teaching/calendar-dates

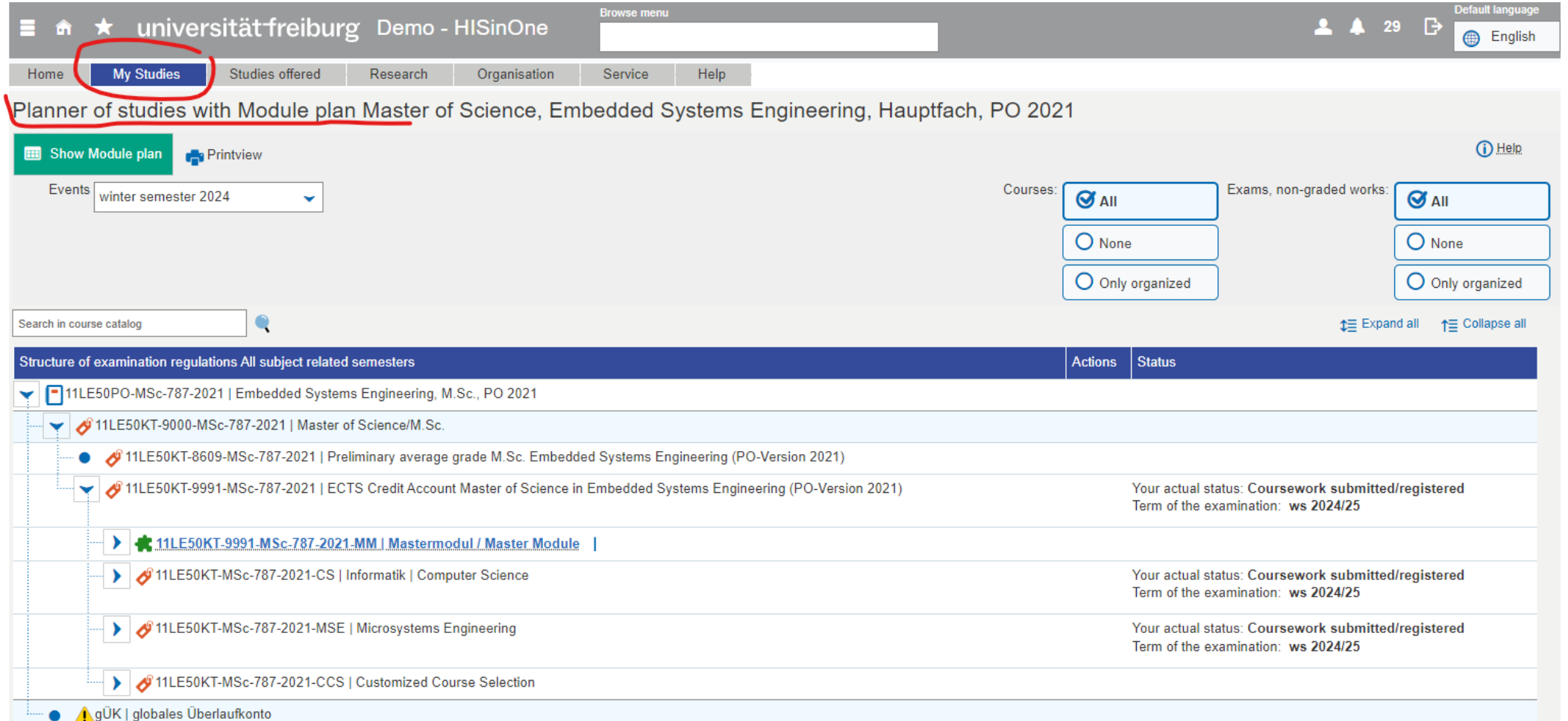
→ Booking deadlines and seat allocation for Bachelor and Master courses)

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!

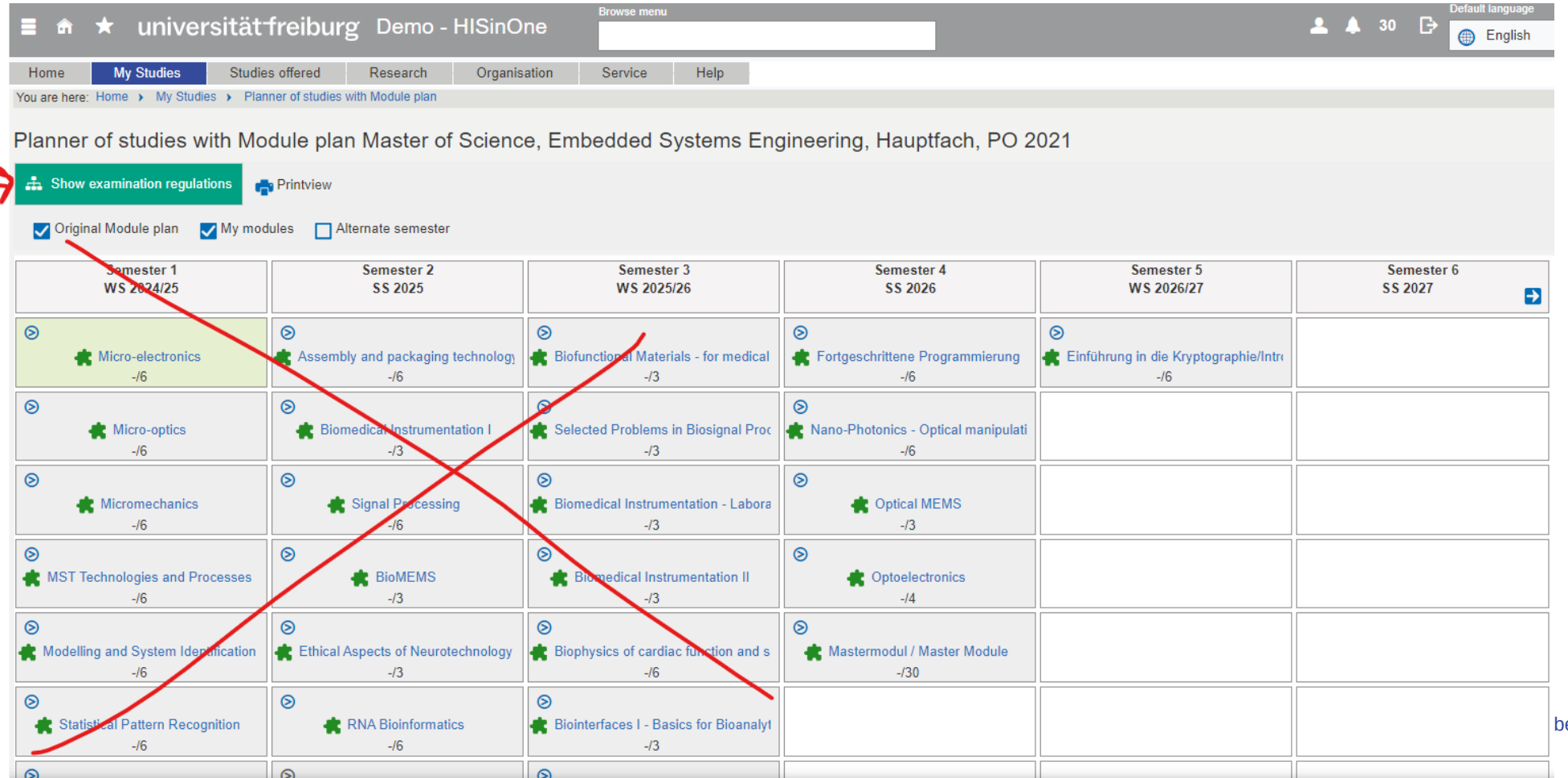
HISinOne Demo:
Login and Planner of Studies

- Log in to https://campus.uni-freiburg.de/



HISinOne Demo:
Planner of Studies – Different views

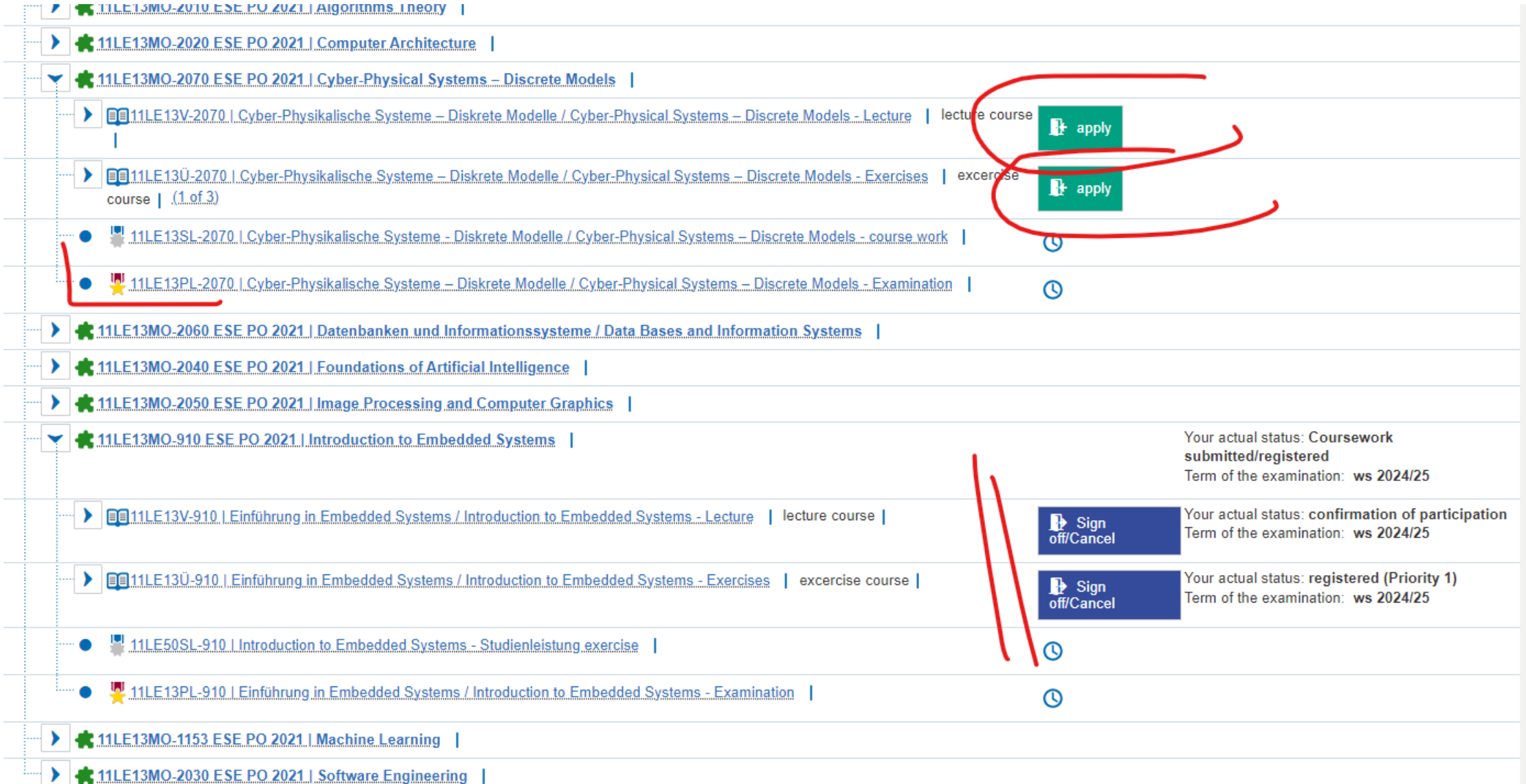
- Use the correct view: Examination regulations



HISinOne Demo:
Examination regulations structure

Structure of examination regulations All subject related semesters	Actions	Status
11LE50PO-MSc-787-2021 | Embedded Systems Engineering, M.Sc., PO 2021		
11LE50KT-9000-MSc-787-2021 | Master of Science/M.Sc.		
11LE50KT-8609-MSc-787-2021 | Preliminary average grade M.Sc. Embedded Systems Engineering (PO-Version 2021)		
11LE50KT-9991-MSc-787-2021 | ECTS Credit Account Master of Science in Embedded Systems Engineering (PO-Version 2021)		Your actual status: **Coursework submitted/registered** Term of the examination: **ws 2024/25**
11LE50KT-9991-MSc-787-2021-MM | Mastermodul / Master Module |		
11LE50KT-MSc-787-2021-CS | Informatik | Computer Science		Your actual status: **Coursework submitted/registered** Term of the examination: **ws 2024/25**
11LE50KT-MSc-787-2021-EssentialCS | Essential Lectures in Computer Science		Your actual status: **Coursework submitted/registered** Term of the examination: **ws 2024/25**
11LE50KT-MSc-787-2021-ElectiveCS | Elective Courses in Computer Science		
11LE50KT-MSc-787-2021-MSE | Microsystems Engineering		Your actual status: **Coursework submitted/registered** Term of the examination: **ws 2024/25**
11LE50KT-MSc-787-2021-AdvancedMSE | Advanced Microsystems Engineering |		Your actual status: **Coursework submitted/registered** Term of the examination: **ws 2024/25**
11LE50KT-MSc-787-2021-ConcentrationsMSE | Microsystems Engineering Concentrations Area		
11LE50KT-MSc-787-2021-MSE-CaS | Circuits and Systems		
11LE50KT-MSc-787-2021-MSE-MaF | Materials and Fabrication		
11LE50KT-MSc-787-2021-MSE-BE | Biomedical Engineering		
11LE50KT-MSc-787-2021-MSE-P | Photonics		
11LE50KT-MSc-787-2021-CCS | Customized Course Selection		
gÜK | globales Überlaufkonto		

HISinOne Demo:
Module – Courses – Assessments



HISinOne Demo:
Registration procedure for seminar or project

- Check out how to book seminars and how to register for projects!

https://www.tf.uni-freiburg.de/en/studies-and-teaching/a-to-z-study-faq/booking-of-pro-seminars-in-computer-science

https://www.tf.uni-freiburg.de/en/studies-and-teaching/a-to-z-study-faq/registering-for-projects

HISinOne Demo:
Advanced MSE and Concentrations

HISinOne Demo:
Customized Course Selection

- Optional; only courses completing with pass/fail assessments

HISinOne Demo:
Multi-connected Elements

- Green and red arrows? Don‘t panic!

Rules regarding examinations

More details will be offered by the examination office team in a presentation in a few weeks.

You‘ll receive an invitation e-mail in time…

Registration for exams / graded assessments (PL)

- It's a second, 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 **do not forget**!
- To make sure you are correctly registered, we recommend saving/printing the pdf of the 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 **very next semester**.
- You can replace 1 course (in CS or MSE) with a failed exam / graded assessment with another one
  (but it has to be done after the first failed attempt; so either repeat or replace)

Improvement of a grade

- 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 exam (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 withdrawels

- 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)

Intellectual honesty / plagiarism

What about AI like ChatGPT?

→ If lecturers don‘t explain their rules about this, please aks them about this!

Don‘t just assume it‘s fine to use, it might be seen as cheating!

- Plagiarism is:
  - Using someone else’s texts, pictures, reports, data, solutions, whatever….
  - ... without citing the source
- Sources include:
  - Books, the internet, colleagues, …
- To make it clear:
  Plagiarism is illegal!
  It is cheating!

- The simple „if...then“ loop:
  - If you cheat (once)
    → then you fail the course
  - If you cheat repeatedly (twice)
    → then you are thrown out of the programme and your academic career is over
- Intellectual honesty is important!
  Don’t pass off someone else's work as your own!

Finding information and help

Students are responsible to stay informed

- You are independent persons, expected to 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 e-mails

    (Make sure to have access to your faculty user account and forward or use that e-mail address!)

If you don‘t find the information, maybe try using a search engine…

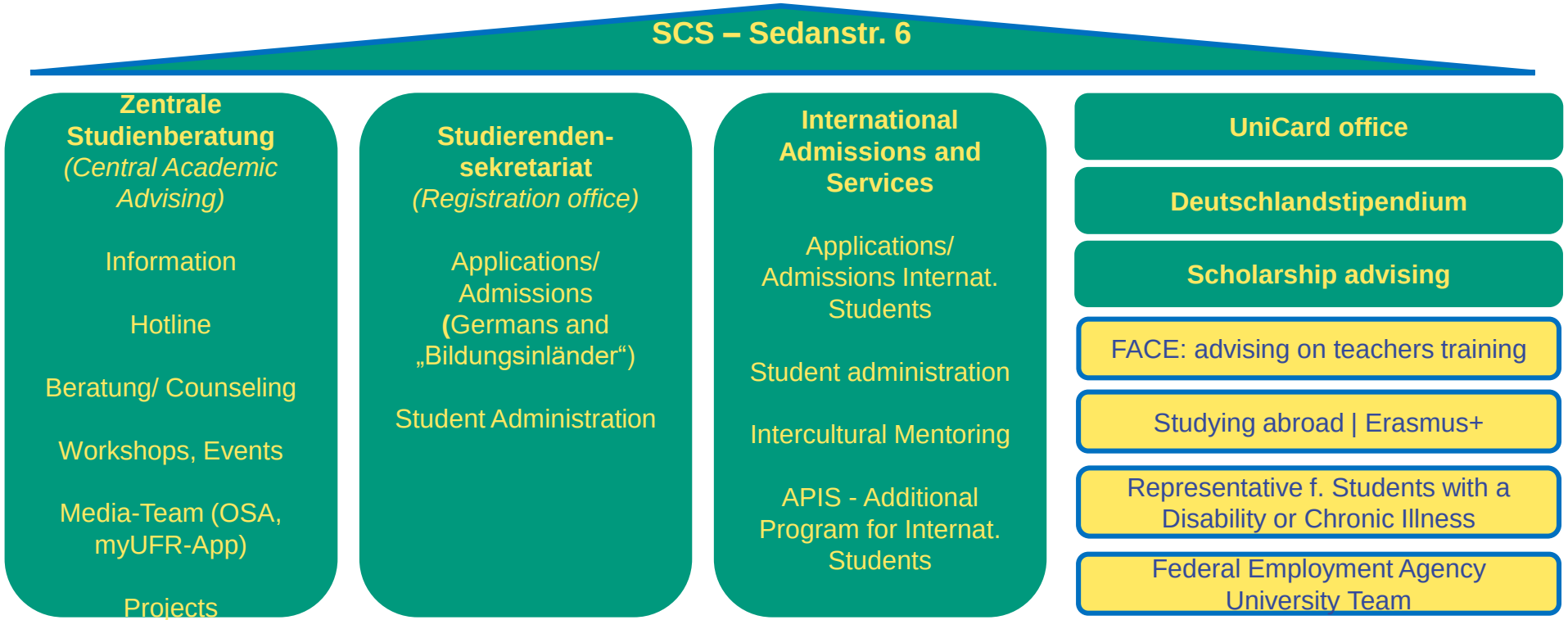
- Reading is essential! Please read! The whole text, all the lines in an email, the complete instructions in exercise or exam sheet…
- „I did not know!“ is not an acceptable excuse!

Check out the information on our websites

- For new students:
  https://www.tf.uni-freiburg.de/en/studies-and-teaching/a-to-z-study-faq/freshers-info
- Dates and deadlines:
  https://www.tf.uni-freiburg.de/en/studies-and-teaching/calendar-dates
- A to Z – Study FAQs (especially useful for information about examination related things):
  https://www.tf.uni-freiburg.de/en/studies-and-teaching/a-to-z-study-faq
- Website for your study programme
  https://www.tf.uni-freiburg.de/en/study-programs/embedded-systems-engineering/m-sc-embedded-systems-engineering
- Contacts for advisory services at TF etc.:
  https://www.tf.uni-freiburg.de/en/study-programs/counseling

Further contact points outside TF:

- SWFR (Housing, Financial Aid / Bafög, Social and Psychotherapeutic Counselling…)
- Student Service Center (SCS) in Sedanstraße 6



Whom to ask about what?

- 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**

When writing an e-mail to an advisor or the examination office…

- Please use a subject – preferably a sensible one
- Assume we do not know you, and we are not clairvoyant.
  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.

Checklist of important things to remember:

- Set up your Faculty account correctly; forward those emails!
- Learn about and observe the various deadlines:
  https://www.tf.uni-freiburg.de/en/studies-and-teaching/calendar-dates
- Register for ***all the elements*** *(especially all the assessments)* in a module you want to complete (not just in lectures, but also in seminars or lab courses)
- Know your exam regulations!
- Learn about registration for seminars and projects:
  https://www.tf.uni-freiburg.de/en/studies-and-teaching/a-to-z-study-faq
- Re-enroll for the next semester
  https://www.studium.uni-freiburg.de/en/student-services/registration
- Contact someone when in need of help:
  https://www.tf.uni-freiburg.de/en/study-programs/counseling

Have a good start!

And remember to wait for your Campus tour guide here in this lecture hall!