

MSc Biomedical Engineering

Orientation Day

Christian Frei, Coordinator MSc BME

September 18, 2023



MSc Biomedical Engineering (BME): Who We Are

Administrative part

Christian Frei

Coordinator MSc BME



Reto Kreuzer

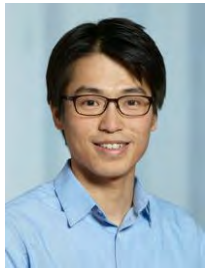
Coordinator of studies, D-ITET*



*Other ETH-departments involved: D-HEST, D-MAVT and D-PHYS

MSc Biomedical Engineering (BME): Who We Are (Track Advisors)

- Bioelectronics
 - Taekwang Jang
 - Janos Vörös
 - Hua Wang
 - Mehmet Fatih Yanik



- Biomechanics
 - Ralph Müller



- Representative D-MAVT
 - Brad Nelson



- Bioimaging
 - Klaas Prüssmann



- Medical Physics
 - Tony Lomax
 - Marco Stampanoni



- Mol. Bioengineering
 - Mark Tibbitt
 - Marcy Zenobi



BEEZ and AMIV

- BEEZ: Biomedical Engineering Student Association
 - Lorenzo Petrella
 - Javi Miragall



- AMIV: Student's Association of D-ITET and D-MAVT



Incoming Class HS23

- 70 students
 - China (2), Czech Republic (1), France (1), Germany (1), Iceland (2), Italy (10), Netherlands (1), Portugal (1), Spain (7), Switzerland (42) and USA (2)



ETH Zurich Bachelors (37)

Males (34), females (36)

Note: Some students are not enrolled yet

Your Studies are Subject to Regulations

- Study regulations
 - www.rechtssammlung.ethz.ch
 - www.master-biomed.ethz.ch

ETH RSETHZ 324.1.0350.53
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

**Programme Regulations 2020
of the Master's degree programme in
Biomedical Engineering**

**Departments of
Information Technology and Electrical Engineering⁽¹⁾ (D-ITET)
Mechanical and Process Engineering (D-MAVT)
Health Sciences and Technology (D-HEST)
Physics (D-PHYS)**

29 October 2019

*This English translation is for information purpose only.
The original German version is the legally binding document.*

	Article
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Appendix 1 Admission	
Appendix 2 Qualification profil	

Version: **29.10.2019 – 0**

¹ Leading department, pursuant to Art. 33, Para. 1 of the ETH Zurich Organisational Ordinance (*Organisationsverordnung ETH Zürich*) of 16.12.2003 (RSETHZ 201.021).

1

Reminder: Student Online Portal

- Your administrative duties on www.mystudies.ethz.ch
- Enrollment to courses and exams:
 - Register for each semester until the end of the second week
 - Register for courses (early in the semester; you need to be registered for a course to enroll for an exam)
 - Submit a study plan/learning agreement (until the end of the 4th week)
 - Enroll for exams – please enroll during the 3rd and 4th week of the semester (withdrawal possible until very late)
- **Read your e-mails!**



Login

You must select the language before logging in.
Die Sprachauswahl kann nur vor dem Login erfolgen.

Use your ETH Zurich account (nethz).

Start

How to Choose / Enroll for Lectures?

- Consult your track advisor!
- Overview of lectures to choose from:
 - <http://www.master-biomed.ethz.ch/education>
- Course catalogue:
 - www.vvz.ethz.ch
 - Level:
 - Master's Degree Programme
 - Department: ITET
 - Programme: Biomedical Engineering Master

MSc Biomedical Engineering Track Bioelectronics Autumn Semester 2023 (HS23) last update: June 26, 2023

■ Core Course
 ■ Recommended Elective Course
 ■ Biology Course

Monday						
08:00						
09:00						
10:00	Frontiers in Nanotechnology					
11:00						
12:00						
13:00						
14:00		Neuromorphic Engineering I	Biomedical Imaging			
15:00						
16:00	Microbotics	Deep Learning		Emerging Memory Technologies	Biomicrofluidic Engineering	Ultrasound Fundamentals and Applications in Biology and Medicine
17:00						
18:00						

Tuesday						
08:00						
09:00		Rehabilitation Engineering II: Rehabilitation of Sensory and Vegetative Functions	Physiology and Anatomy for Biomedical Engineers I	Medical Technology Innovation - From Concept to Clinic		
10:00					Cross-Disciplinary Research and Development in Medicine and Engineering	
11:00						
12:00		Biomicrofluidic Engineering				
13:00						
14:00			Biomedical Imaging			
15:00						
16:00		Microsystems I: Process Technology and Integration	Cell Biophysics			
17:00						
18:00						

Wednesday						
08:00						
09:00						
10:00	Qubits, Electrons, Photons	Analog Signal Processing and Filtering	Biomedical Engineering	Deep Learning in Artificial and Biological Neural Networks	Wearable and Mobile Technologies of the Future - Focus on Sports and Health	
11:00						
12:00	Deep Learning					
13:00		Molecular Health Sensors and Devices	Introduction to Photonics	Biological Engineering and Biotechnology	Computer Vision	Bio-compatible Materials
14:00						
15:00						
16:00	Deep Learning	Acoustics in Fluid Media: From Robotics to Additive Manufacturing	Micro/Nanotechnology and Microfluidics for Biomedical Applications			
17:00						
18:00						

Thursday						
08:00		Molecular Health Sensors and Devices			Introduction to Neuroinformatics	Physical Modelling and Simulation
09:00						
10:00					Qubits, Electrons, Photons	
11:00	Nanosystems					
12:00		Computer Vision				Microbotics
13:00	Computer Vision	Microsystems I: Process Technology and Integration				
14:00						
15:00						
16:00	Seminar on Digital Humans	Cell Biophysics	Image Analysis and Computer Vision	Biological Methods for Engineers (Basic Lab)	Introduction to Photonics	Deep Learning
17:00						
18:00						

Friday						
08:00						
09:00						
10:00						
11:00						
12:00						
13:00	Computer Vision	Qubits, Electrons, Photons				
14:00		Physics in Medical Research: From Atoms to Cells		Frontiers in Nanotechnology	Analog Integrated Circuits	
15:00						
16:00	Introduction to Estimation and Machine Learning					
17:00						
18:00						

UZH: Systems Neuroscience
 Not offered in HS23: Computational Psychiatry & Computational Psychosomatics

Note: This is an informal help for students. The official courses can be seen on the Course Catalogue of ETH (www.vvz.ethz.ch)

120 Credits ECTS to Fulfill the MSc BME

- Mandatory credits

– Track Courses	52 CP
– Track Core Courses, at least 12 CP	
– Recommended Elective Courses	
– Biology Courses	
– Semester Project	12 CP
– Master Project	30 CP
– Science in Perspective (SiP)	2 CP

Part of the learning agreement (see below)

- Sum 96 CP

120 Credits ECTS to Fulfill the MSc BME

- Mandatory credits

- Track Courses 52 CP
 - Track Core Courses, at least 12 CP
 - Recommended Elective Courses
 - Biology Courses
- Semester Project 12 CP
- Master Project 30 CP
- Science in Perspective (SiP) 2 CP

- Sum 96 CP


- Selected choice

- More Track Courses up to 24 CP
- Additional Projects and Laboratory Courses
 - Semester Project 2 12 CP
 - Research Project 6, 12, 18 or 24 CP
 - Industry Internship 12 CP

- Sum 24 CP

Learning Agreement / Individual Study Plan

- Select tutor
- Discuss your choice with the track advisor, edit and submit the list in *myStudies* by the end of the fourth week of the semester
- Contains all core courses, recommended elective courses and biology courses
- Track advisors can allow courses not pre-defined for a particular track
- Only these courses can be accounted for the final degree



The screenshot shows the 'myStudies' interface for a student in the 'Electrical Engin. + Information Technology MSc' program. The 'Matriculation' section is active, displaying the current semester as 'Spring Semester 2016, enrolled'. A 'Select Tutor' button is highlighted in yellow. Other buttons include 'Back', 'Course registration', 'Projects/papers/theses', 'Examinations', 'Transcript of records', 'Learning Agreement', 'Studies overview', and 'Degree request'. The 'Contact' section at the bottom provides information for administrative and programme-specific questions.

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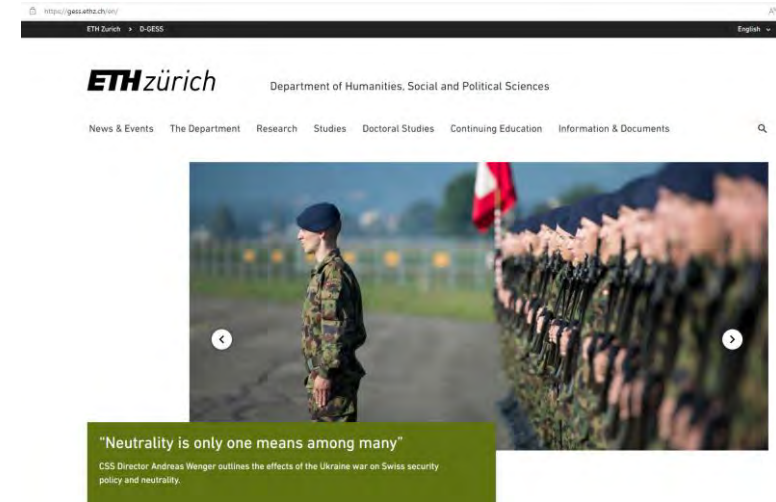
- Sum 24 CP

Need to be supervised by a Professor from a [predefined list](#)
>100 Professors from 9 different departments at ETH Zurich
No approval by track advisor required

120 Credits ECTS to Fulfill the MSc BME

- Mandatory credits
 - Track Courses 52 CP
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 - Recommended Elective Courses
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 - Semester Project 12 CP
 - Master Project 30 CP
 - Science in Perspective (SiP) 2 CP

- Sum 96 CP



The SiP courses are mandatory for all students at ETH Zurich

SiP courses are selected and offered by the Department of Humanities, Social and Political Sciences (D-GESS)

Contact: Study admin D-GESS, Malte Bachem, malte.bachem@gess.ethz.ch

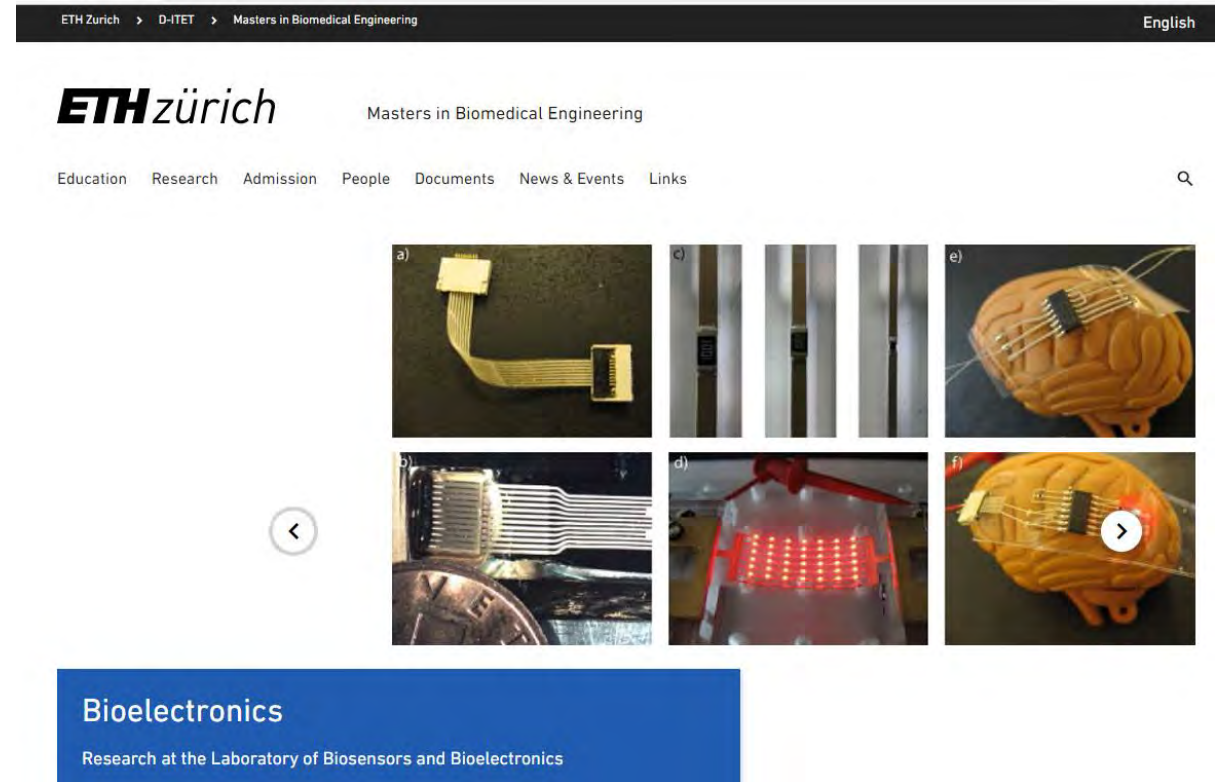
<https://gess.ethz.ch/en/studies/science-in-perspective.html>

Questions?

- Come to us
- This presentation can be downloaded from our website:
 - <http://www.master-biomed.ethz.ch/>

ETH zürich

**BIOMEDICAL
ENGINEERING**



ETH Zurich > D-ITET > Masters in Biomedical Engineering English

ETH zürich Masters in Biomedical Engineering

Education Research Admission People Documents News & Events Links

a) b) c) d) e) f)

Bioelectronics
Research at the Laboratory of Biosensors and Bioelectronics

ETH zürich

Dr. Christian Frei
Coordinator MSc Biomedical Engineering
frei@biomed.ee.ethz.ch

ETH Zürich
D-ITET
Gloriastrasse 37/39, GLC F 12.2
8092 Zürich

D-ITET Contacts + Information – for MSc Biomedical Engineering students

September 18, 2023

Reto Kreuzer, Coordinator of Studies / Student Advisor, D-ITET

Agenda

1. The D-ITET – your new host department
2. Finding the right contact
3. Courses, exams and credits
4. Useful information

$$\int_{\partial V} (\mathbf{E} \times \mathbf{H}) \cdot \mathbf{n} \, d\mathbf{a} + \frac{\partial}{\partial t} \int_V \mathbf{p} \, dV$$

$$-\int_V \mathbf{j} \cdot \mathbf{E} \, dV - \frac{1}{2} \int_V \left[\mathbf{E} \cdot \frac{\partial \mathbf{P}}{\partial t} - \mathbf{P} \cdot \frac{\partial \mathbf{E}}{\partial t} \right] dV - \frac{\mu_0}{2} \int_V \left[\mathbf{H} \cdot \frac{\partial \mathbf{M}}{\partial t} - \mathbf{M} \cdot \frac{\partial \mathbf{H}}{\partial t} \right] dV$$

$\vec{D} = \epsilon_0 \vec{E} + \vec{P}$
 $\vec{H} = \frac{1}{\mu_0} \nabla \times \vec{A} - \dot{\vec{P}}$
 $\nabla \cdot \vec{D} = \rho_{\text{ext}}$
 $\nabla \times \vec{H} = \mathbf{j}_{\text{ext}} + \dot{\vec{P}}$
 $\nabla \cdot \vec{j} + \frac{\partial \rho}{\partial t} = 0$




The D-ITET –
 Optimal support for over 2500 students



Numbers

BSc	ETH D-ITET	10'665 786	<ul style="list-style-type: none"> • 41 professors • 50+ other lecturers • 500+ PhD students • Study administration • AMIV (incl. LIMES) • IT support
MSc	ETH D-ITET Electrical Engineering MSc Biomedical Engineering MSc Energy Science & Technology MSc Quantum Engineering MSc <i>Neural Systems & Comp. MSc (UZH)</i>	8'737 1'031 565 194 105 115 52	
Exchange	ETH D-ITET	386 49	

Professors



Prof. Luca Benini



Prof. Jürgen Biela



Prof. Helmut Böltskei



Prof. Colombo Bolognesi



Prof. Florian Dörfler



Prof. Christian M. Franck



Prof. Benjamin Grewe



Prof. Ulrike Grossner



Prof. Richard Hahnloser



Prof. Gabriela Hug



Prof. Giacomo Indiveri



Prof. Taekwanq Jana



Prof. Lana Josipovic



Prof. Johann W. Kolar



Prof. Ender Konukoolu



Prof. Sebastian Kozerke



Prof. Amos Lapidoth



Prof. Jürg Leuthold



Prof. Hans-Andrea Loeliger



Prof. Mathieu Luisier



Prof. John Lygeros



Prof. Valerio Mante



Prof. Onur Mutlu



Prof. Lukas Novotny



Prof. Mickaël Perrin



Prof. Klaas P. Prüssmann



Prof. Daniel Razansky



Prof. Kaveh Razavi



Prof. Metin Sitti



Prof. Marco Stampanoni



Prof. Klaas Enno Stephan



Prof. Christoph Studer



Prof. Luc Van Gool



Prof. Laurent Vanbever



Prof. János Vörös



Prof. Hua Wang



Prof. Roger P. Wattenhofer



Prof. Vanessa C. Wood



Prof. Mehmet Fatih Yanik



Prof. Maksym Yarema

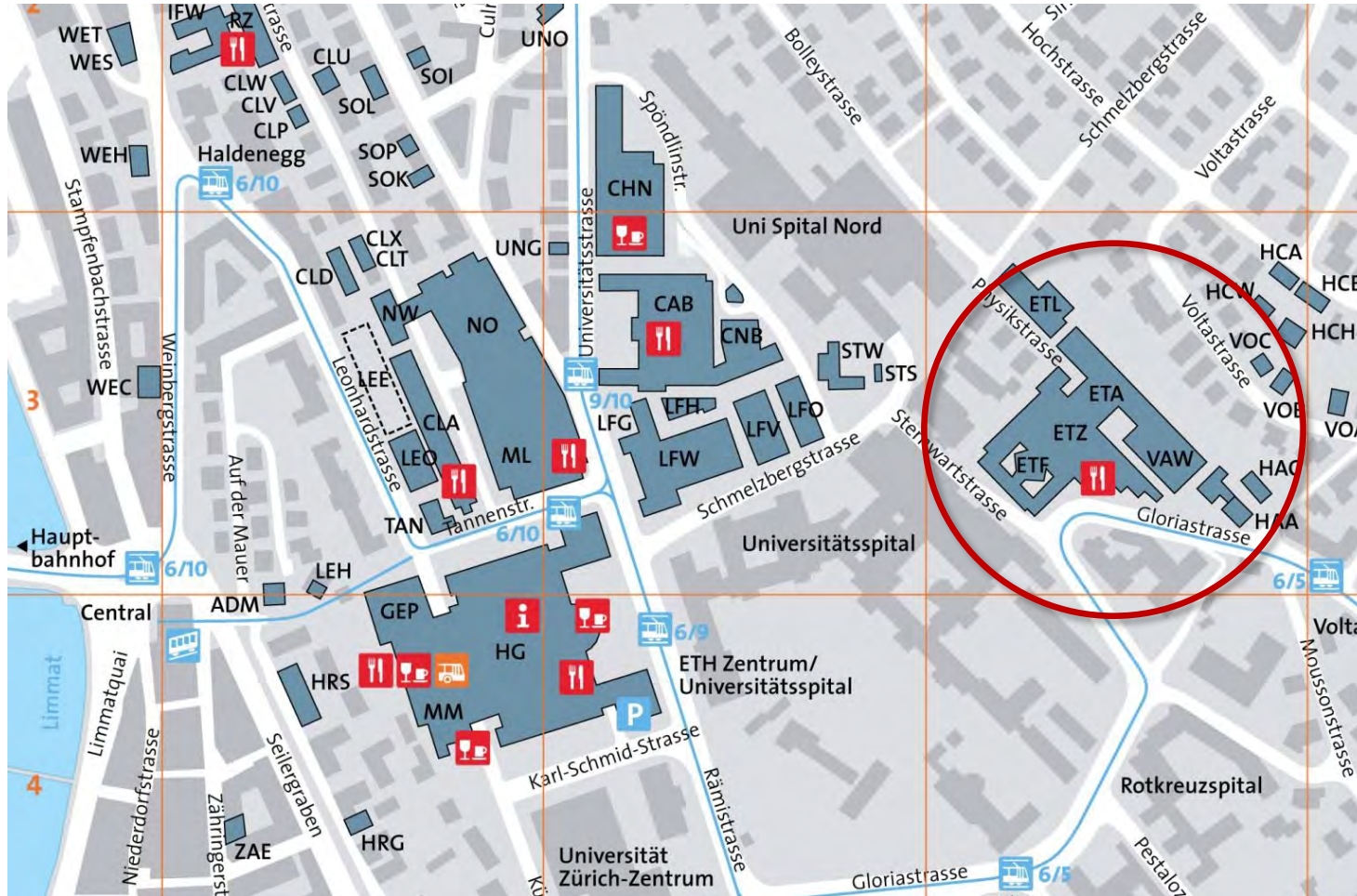


Prof. Fisher Yu



Finding your contacts

Map of ETH and D-ITET



Where do I find information on the web?

- **General Information on studies at ETH**

ETH students' website: www.ethz.ch/students

- **Information on the Master in Biomedical Engineering**

D-ITET website: www.master-biomed.ethz.ch

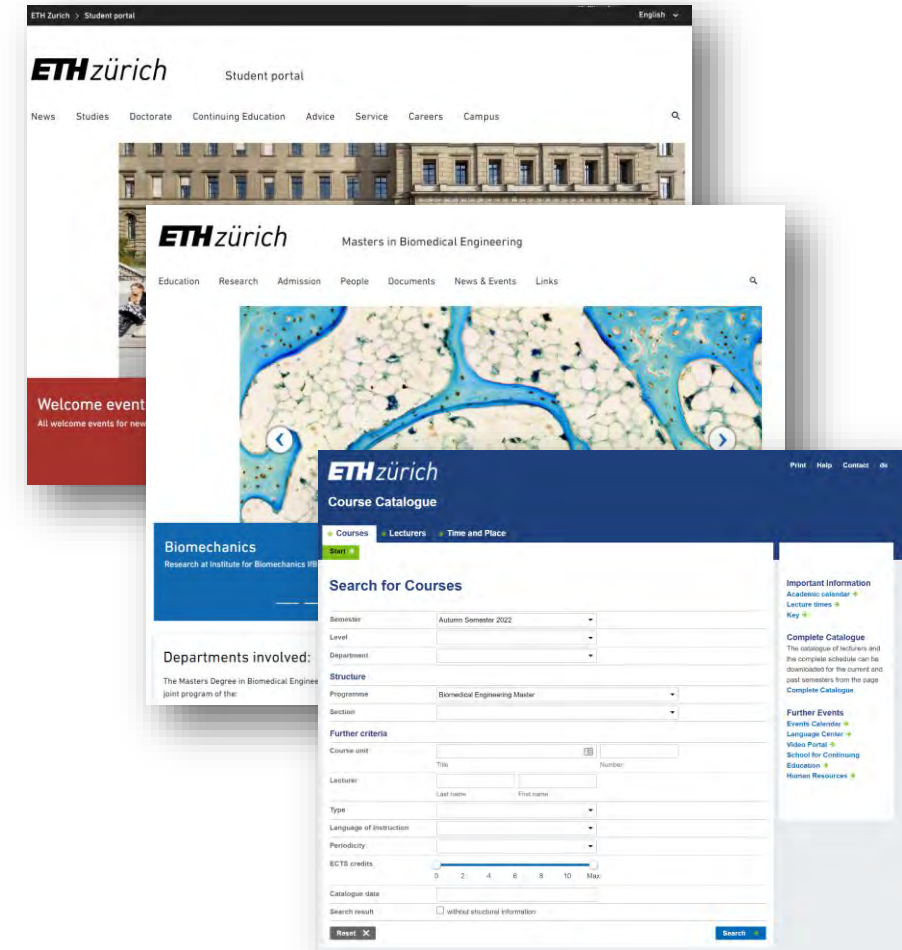
- **Course catalogue**

Online: www.vvz.ethz.ch > Programme > Electrical Engineering (...) Master

- **Messages from ETH and the Department**

Email on your ETH-Address (username@student.ethz.ch)

→ **check your mailbox regularly and read the messages carefully!**



Your most important contacts at ETH and the D-ITET

ETH / Rectorate

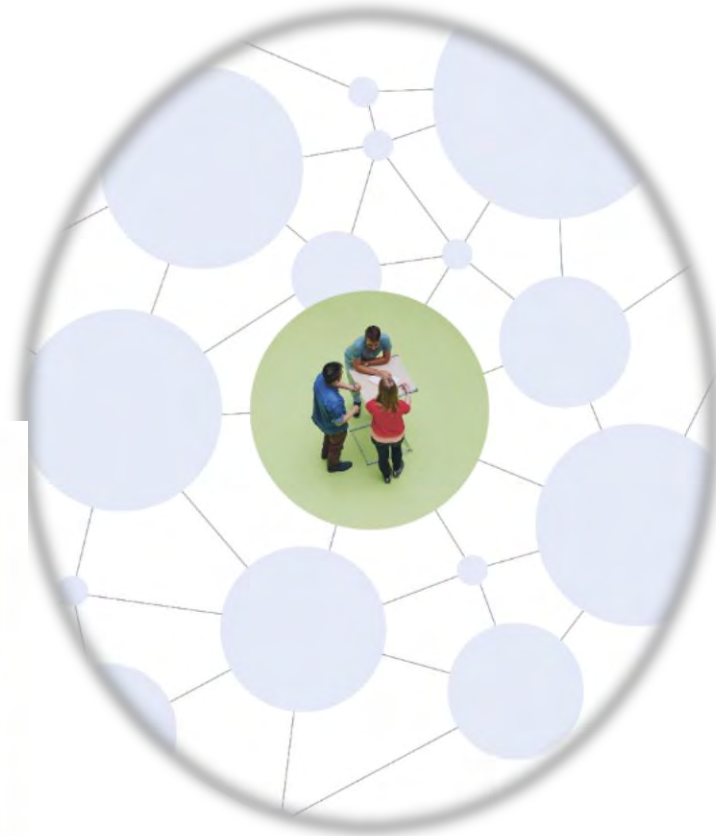
Registrar's Office (HG F 19)

General administrative questions
e.g. matriculation, address changes,
residence etc.

Students' association

AMIV (CAB E 37)

Social contacts,
networking



D-ITET / central services

Student Admin (ETZ H 85)

Study specific admin. questions
e.g. grades/transcripts, waivers, counselling

Tutors / Lecturers / TA

Course specific questions, study plan

Your contacts at the D-ITET



Prof. Sebastian Kozerke
Director of studies D-ITET

ETZ F 94
+41 44 632 53 25
kozerke@biomed.ee.ethz.ch



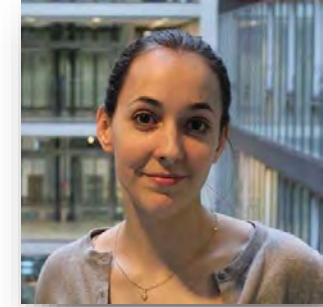
Reto Kreuzer
Head of Student
Administration /
Student advisor

ETZ H 83
+41 44 632 08 15
info@ee.ethz.ch



Andrea Salow / Tali Scheiner
Student Administration

ETZ H 85
+41 44 632 50 03
info@ee.ethz.ch



Audrey Djouadi
Course scheduling /
Student exchange advisor

ETZ H 87
+41 44 632 89 57
info@ee.ethz.ch



Administrative matters

myStudies – do not forget to...

Register for courses and exams

- Register for each semester until the end of the second week
- Register for **courses** early in the semester; you need to be registered for a course to enroll for an exam
- Submit the **tutor agreement** – until the **end of the 4th week** of the semester
- Enroll for **exams** – enroll during the **3rd and 4th week** of the semester, withdrawal possible until very late

Notify us of your address changes


Read your E-Mails!

Enrolling for courses

- All courses you wish to **count** towards your Master **Diploma** must be **enrolled** for (both the course and the exam);
- Only **courses agreed upon** by your **track advisor** will count for the degree, other courses go on a separate sheet, attached to the final transcript.
- In particular, do not forget to enroll for the **Semester Projects** and the **Master Thesis** (special section in myStudies "Projects/Papers/Theses).

Performance Assessments

- Three types of performance assessments:
 - **Session examination** (Winter session: January/February – Summer session: August), **Attention to registration/deregistration deadlines**
 - **End-of-semester examination (2 weeks before end of lectures until 2 weeks after end of lectures)**, **Attention to registration/deregistration deadlines**
 - Graded/ungraded **semester performance** (e.g. semester project or internship in industry (performance during semester), **Attention minimum/maximum allowed time/deadlines**
- Passed exams **cannot be re-taken**, failed exams can be re-taken once!
- Special rules may apply regarding **allowed (written) aids**:
 - Course catalogue > see "Performance assessment"
 - Personal exam schedule in myStudies (for session examinations)
 - Lecturer/examiner



Information

Useful information

Counselling at ETH and the D-ITET

- Course selection ? → your track advisor
- Studies at D-ITET, i.e., deadlines, failures at examinations etc. ? → the coordinator of studies
- General questions regarding your arrival at ETH ? → [international student support](#)
- Time management / motivation ? → [student coaching](#)
- Difficult phases / personal problems ? → [psychological counselling service](#) (free of charge and confidential)

Computer infrastructure at ETHZ / D-ITET

- All public ETH-computers, e.g., Main Building HG D 11, or ET-Building ETZ D 61.1, require your **n.ethz** password, same as used for myStudies
- Only ITET students can access the computer infrastructure in the ET-building area, should you encounter a problem, contact D-ITET IT-support
- [Project Neptune](#) – during a short period (until October 3), laptops and tablet computers may be purchased through ETH at interesting prices
- [IDES](#) – ETH also offers software at very low cost, some products even for free.
Remember: the use of non-licensed software is forbidden and subject to prosecution!



7 November 2023
16.00–19.00

ETH Library
InfoCenter
Rämistrasse 101, HG

- Get prepared to stay on time with your studies and your Master's thesis
- **Know where to find help** before the workload peaks
- Meet your peers, expand your **network**
- Enjoy **impro theatre** and a **free drink**

More information at:
library.ethz.ch/rock-your-masters

Code of conduct

« At D-ITET, we maintain an inclusive, open and friendly environment, where our students, employees and faculty can thrive and achieve their highest potential, based on mutual respect. To preserve this cordial environment, we do not tolerate misbehavior of any kind, including threats, violence, bullying, sexual harassment, discrimination, or dishonesty in study and in research. »

Prof. Jürg Leuthold, Head of Department

Further information on the Web:

- Our principles
- What is “inappropriate behavior”?
- How to react?
- Contacts / support



More details?

- **My Office**

Reto Kreuzer, Study Coordinator D-ITET, ETZ H 83

Please send an E-mail to fix an appointment (reto.kreuzer@ee.ethz.ch)

- **This presentation**

Available tomorrow morning on www.ee.ethz.ch > Studies > Forms and Documents

Enjoy your studies at ETH!

