

Medicine & Engineering

Our strong combination at FAU Erlangen-Nürnberg

Welcome Master's students
Medical Engineering!

MA MT at FAU | Claudia Barnickel

ZiMT
ZENTRALINSTITUT FÜR MEDIZINTECHNIK

FAU

FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

- **Welcome by Simone Reiprich**
(Director Central Institute for Healthcare Engineering /ZiMT)
- **Introduction to the program by Claudia Barnickel**
(Program Coordinator and Advisor Medical Engineering)
- **Welcome by FSI Medizintechnik**
(Student association Medical Engineering)
- **Group quiz: Fun facts about Germany and Franconia**

10:15-10:45 Coffee break

- ❑ **Group quiz: solutions and prizes**
- ❑ **Introduction computer pools & creating your class schedule**
(1st floor, blue computer science tower)

12:45-13:45 Lunch break (Mensa)

- ❑ **Guided campus tour**
(starting point: round bench in front of Mensa, red square)

From 14:15 Get-together with drinks (same bench)

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The diversity of Medical Engineering at FAU



Growth Market Medical Technology

- **Increase in population and diseases**

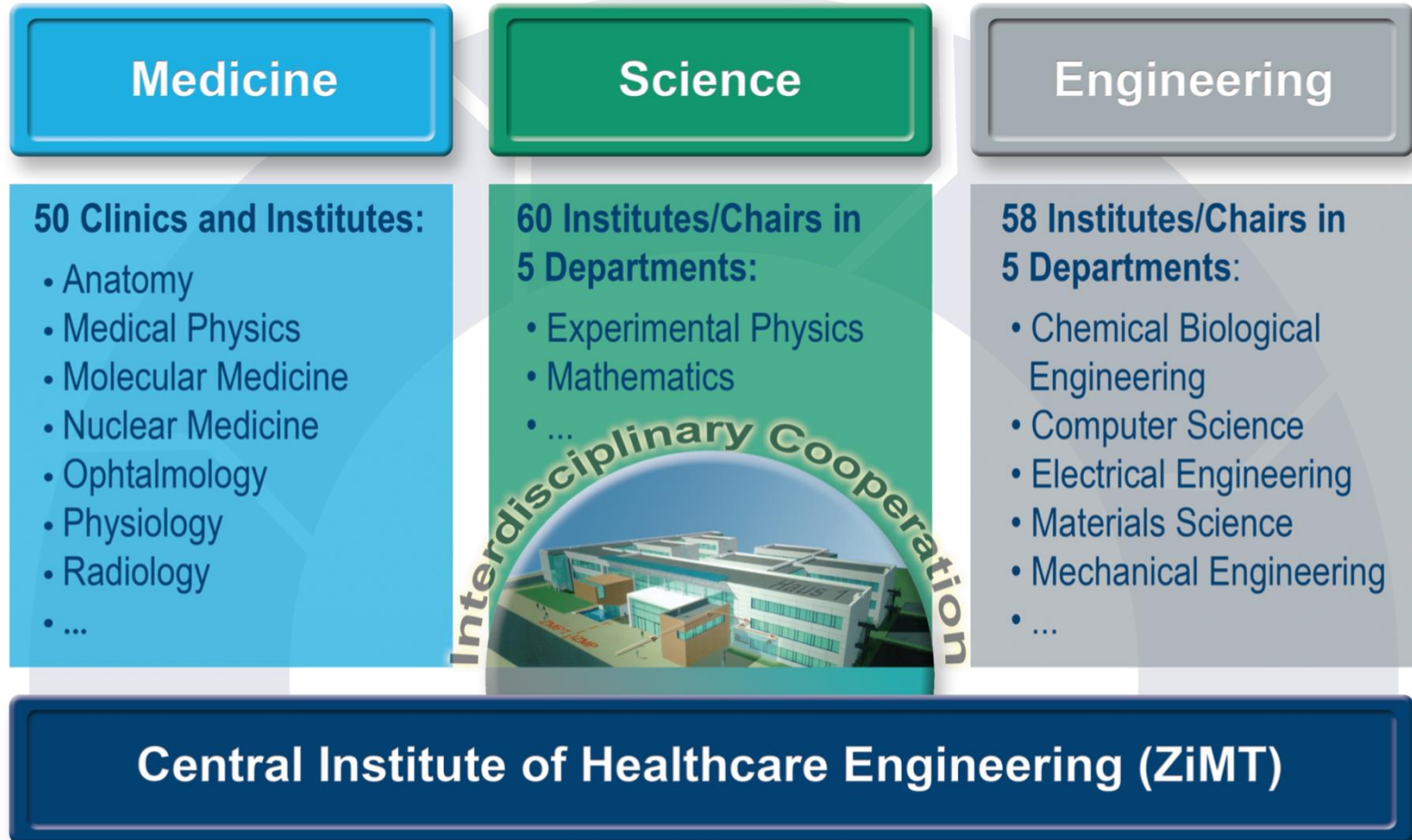
- Demographical development until 2050:
More people, longer life expectancy:

● Diabetes	+ 50 %	Dementia	+ 100 %
● Infarction	+ 100 %	Stroke	+ 100%
● Cancer	+ 50 %		

- **Increasing demand for diagnostic and therapeutic treatment**



Strategic Cooperation of Faculties for Interdisciplinary Research & Teaching



A: Neues HS-Gebäude, *Ulmenweg 18*

B: Audimax, *Bismarckstr. 1*

C: Anatomie, *Universitätsstr. 19*

D: Biochemie, *Fahrstr. 17*

E: Organische Chemie, *Henkestr. 42*

F: ZiMT/MVC, *Henkestr. 91*

G: Physikum, *Staudtstr. 5*

H: Südgelände, *Egerlandstr. 3*

➔ „Bicycle Distance“





Persons in Charge



Program representatives

- **Program Director**
(Chair for Pattern Recognition)
Studiengangsverantwortlicher
 - Prof. Dr.-Ing. Andreas Maier
- **Program Coordinators (ZiMT)**
Studiengangskoordinatoren
 - Dr. nat. Simone Reiprich
 - Deputy: Dipl.-Ing. Tobias Zobel



Contact Persons

- **Study Program Coordinator and Advisor**

Claudia Barnickel

blue computer science tower, 2nd floor, room 02.158

Open consultation hours (no appointment):

Mon-Thu, 1-4 pm

Claudia.Barnickel@fau.de



- planning your studies
- accreditation of coursework achievements
- support with formalities
- all kinds of questions regarding your studies
- personal problems

Contact Persons

- **General Study Advisory**

Informations- und Beratungszentrum (IBZ)

Elisabeth Bächle-Grosso

Halbmondstr. 6 -8

91054 Erlangen

Room: 1.031

elisabeth.baechle-grosso@fau.de



- general study-related problems
- information about changing your study program
- student visa issues (certificate for foreigners office)

Contact Persons

● Examinations Office

Prüfungsamt

Helga Jahreis

Halbmondstraße 6

91054 Erlangen

Room: 1.042

helga.jahreis@fau.de



- managing credits, grades, exams
- hand in paper certificates („Scheine“)
- withdrawal from exams (illness)
- report on conditional subjects/“Auflagen“

Contact Persons

- **International Office School of Engineering/TechFak**

Christine Mohr

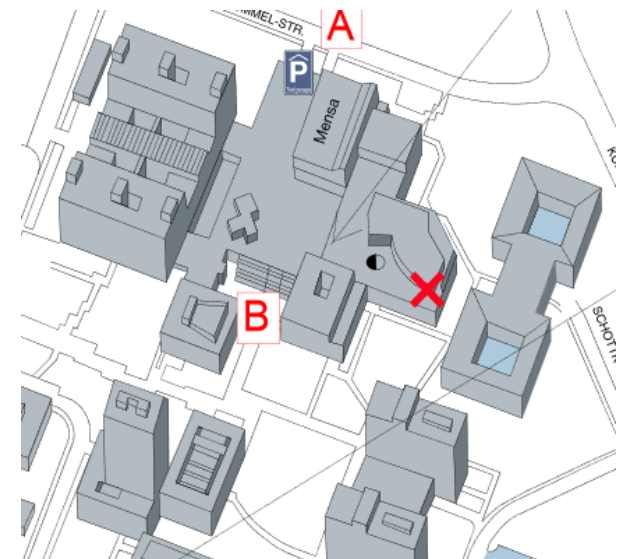
Erwin-Rommel-Str. 60

91058 Erlangen

Room: U 1.250

christine.mohr@fau.de

- Info about studying/interning abroad
- General help and support for international students



Contact Persons

• Career Service

Susanne Winkelmaier, Nicole Jakob, Stefanie Rösch

career-service@fau.de

www.career.fau.de

- Help with your job search
- Support with applications
- Check of application documents
- Useful workshops and seminars



● Office for Gender and Diversity

Bismarckstraße 6

91054 Erlangen

gender-und-diversity@fau.de

- Support for women (in cases of violence, harassment)
- Advice for students with children
- Help for students with a migratory background
- Support for students experiencing discrimination of any kind (due to gender, ethnicity, religion, sexual orientation etc.)



Contact Persons

- **Help with personal crisis**

Psychological support Studentenwerk:

Psychologisch-Psychotherapeutische
Beratungsstelle
Hofmannstraße 27, 2nd floor
91052 Erlangen

Open consultation (anonymous, without appointment):

Tue, 1:30 to 4:30 pm



Legal advisory service Studentenwerk:

Hofmannstraße 27, 2nd floor, Room 201
See website for consultation hours:

www.werkswelt.de

One URL → all university services:

- www.fau.eu/study/current-students/
- www.fau.de/studium/im-studium/

One URL →

all Medical Engineering services:

- **www.medical-engineering.study.fau.eu/**
- **www.medizintechnik.fau.de**

Program Structure



Structure Master's Program Medical Engineering

Branches of Study

- Medical Electronics (German)
- Medical Image and Data Processing (German or English)
- Medical Production Technology, Device Engineering and Prosthetics (German)

Academic Lab & Research Lab

10 ECTS

Master's Exam

(exams taken during studies:
80 ECTS)

Master's Thesis

Duration: 6 Months/30 ECTS

Master of Science (M.Sc.)

120 ECTS

What is “ECTS”?

- ***European Credit Transfer and Accumulation System***
Student workload required for the learning outcomes of a program
 - 30 credits = **recommended** workload per semester
 - 1 credit \cong 25 to 30 working hours
- You will find information on ECTS in the module catalogs, in the online information system UnivIS, on your Master’s certificate/Transcript of Records

Semesters & Exams at the Faculty of Engineering

- Regular study time: 4 semesters/two years (**can be extended to 5**)
- 1 semester consists of the lecture period (12-14 weeks)+ holidays/lecture-free period (~12 weeks)
- Two exam periods: first 2 weeks and last 3 weeks **of the holidays**
- Failing an exam: **2nd + 3rd chance** in the **following** two semesters (**mandatory** registration) - **except conditions!**
- You can/must only take exams if you **register** for them.
- You can **withdraw** from registered exams until the 3rd working day before the exam date without any reason or even later in case of illness (medical certificate).

Semesters & Exams at the Faculty of Engineering

Summer Semester 2017: 01.04.2017 – 30.09.2017

- Lecture Period: 24.04. - 30.07.
- Exam Registration: 05.06. - 23.06.
(Reminder via email!)
- Re-Registration for WS 17/18: 03.07. - 10.07.
(Reminder via email!)
- Semester break (no lectures): 31.07. – 15.10.
- Exams: 31.07.-12.08. and 22.09.-14.10.

<https://www.fau.eu/study/current-students/semester-dates/>

Conditional subjects/”Auflagen”


- **Must be passed within one year (deadline: 31.03.18).**
Otherwise they will prevent successful re-registration for the 3rd semester. **No exceptions!**
- **After successful completion of conditional subjects:**
inform Mrs. Jahreis (Examinations Office)
- **Examination results of the 2nd semester might be published late (after the deadline).**
If this is your case contact the Examinations Office in due time and ask for a **fast correction!**

Conditional subjects/“Auflagen“

Lectures are only offered once a year (summer or winter):

- Grundlagen der Elektrotechnik II: SS
- Algorithmen und Datenstrukturen MT: WS (exercise class and exam also in SS)
- Mathematik A3: WS (access to study materials and exam also in SS → **contact lecturer**)
- Engineering Mathematics: SS
- Advanced Programming Techniques: lecture and exam + project only in WS → **start studying C++ now!** (consult with lecturer + info in UnivIS)

Master Course Scheme (from examinations regulation/FPO)



No.	Module groups	ECTS credits	Recommended semester distribution ⁸⁾				Type and scope of the course and examination achievement ⁴⁾
			1.	2.	3.	4.	
M 1	Medical specialisation modules according to the catalogue of elective modules for all branches of study ^{1) 2) 3)}	10	5	5			EA: written examination (Klausur) 60/90 min. /oral examination 30 min.
M 2	Engineering core modules according to catalogue of elective modules for specific branch of study ^{2) 3)}	20	10	10			EA: written examination (Klausur) 60/90 min. /oral examination 30 min.
M 3	Medical Engineering core modules according to catalogue of elective modules for specific branch of study ^{3) 5)}	20	10	10			EA: written examination (Klausur) 60/90 min. /oral examination 30 min.
M 4	Medical Engineering core skills according to basic curriculum in catalogue of elective modules for specific branch of study ³⁾	10	5		5		EA (reports + presentations acc. to dept. specifications)
M 5	Medical Engineering specialisation modules according to catalogue of elective modules for specific branch of study ^{3) 8)}	10		5	5		EA: written examination (Klausur) 60/90 min. /oral examination 30 min.
M 6	Medical Engineering practical skills according to the catalogue of elective modules for all branches of study ³⁾	10			10		uCA (reports acc. to module descriptions and dept. specifications)
M 7	Flexible budget ⁷⁾	10			10		EA: according to applicable examination regulations
M 8	Master's thesis	30				30	EA (report + presentation)
	Total ECTS credits ⁹⁾	120	30	30	30	30	

Module Catalogs (www.medizintechnik.studium.fau.de)

Typ	Modulnummer	Modulbezeichnung (Veranstaltungsname)	Abkürzung	V+Ü+S+P	Gesamt					Studien- und Prüfungsleistungen	Department	Modulverantwortlicher / Dozent	V	
					ECTS	1. Jahr		2. Jahr						PL
						WS	SS	WS	SS					
M 1 Medizinische Vertiefungsmodule														
	M 1.1 ¹	Grundlagen der Anatomie & Physiologie für Nichtmediziner Clinical Applications of Optical Technologies and Associated Fundamentals of Anatomy	AnaPhys_MIT OMED/CA	4+0+0+0 4+0+0+0	5 5	2,5 5	2,5 5	0 0	0 0	60 s 45 s	VORKLIN KLIN	Prof. Dr. Clemens Forster Prof. Dr. med. Michael Eichhorn	WS/SS SS	
	M 1.2	Medizinische Vertiefung 1		5	5	0	0	0	0	60 s	KLIN	N.N.	WS	
	M 1.3	Medizinische Vertiefung 2		5	0	5	0	0	0	60 s	KLIN	N.N.	SS	
	Liste der Lehrveranstaltungen für M1.2 bzw. M1.3													
		Interdisziplinäre Medizin		0+0+2+0	2	2	0	0	0	45 s		Prof. Dr. med. Harald Mang	WS	
		IT-Unterstützung im Prozess der diagnostischen Bildgebung		1+0+0+0	1	1	0	0	0	45 s		Dr. Thomas Kauer	WS	
		Grundlagen der biologischen Stromleitung		2+0+0+0	2	2	0	0	0	45 s		Prof. Dr. med. Ulf G. Distler	SS	
		Grundlagen der optischen Strahlentechnik		2+0+0+0	2	2	0	0	0	45 s		Prof. Dr. med. Ulf G. Distler	WS	
		Grundlagen der Krankheitserkennung		4+0+0+0	5	5	0	0	0	90 s		Prof. Dr. med. Harald Mang	WS	
		Medizinische Biotechnologie	MBT	3+1+0+0	5	5	0	0	0	120 s		Prof. Dr. med. habil. Dr. rer. nat. Oliver Friedrich	WS	
		Audiologie und Hörgeräte		1+0+3+0	5	5	0	0	0	90 s		Prof. Dr.-Ing. Dr. rer. med. Ulrich Hoppe	WS	
		Medizinische Physik in der Diagnostik		1+0+0+0	1	1	0	0	0	45 s		Prof. Dr. rer. med. Ulf G. Distler	WS	
		Cognitive Neurowissenschaften		1+0+0+0	1	1	0	0	0	45 s		Prof. Dr. rer. med. Ulf G. Distler	WS	
		Augendiagnostik		1+0+0+0	1	1	0	0	0	45 s		Prof. Dr. rer. med. Ulf G. Distler	WS	
		Augenoperationen		1+0+0+0	1	1	0	0	0	45 s		Prof. Dr. rer. med. Ulf G. Distler	WS	
		Augenbeteiligung bei Allgemeinerkrankungen		1+0+0+0	1	1	0	0	0	45 s		Prof. Dr. rer. med. Ulf G. Distler	WS	
		Sehnervmorphologie und Echographie in der Augenheilkunde		1+0+0+0	1	1	0	0	0	45 s		Prof. Dr. rer. med. Ulf G. Distler	WS	
	M 2 Ingenieurwissenschaftliche Kernmodule													
	Basismodule / Basic Modules (B)													
	M 2.1	Ereignisgesteuerte Systeme Übung	EGS	2+2+0+0	5	5	0	0	0	90 s	INF	Dr.-Ing. Michael Glaß	WS	
	M 2.2	Grundlagen der Systemprogrammierung (Systemprogrammierung 1) Übung	GSP (SP 1)	2+2+0+0	5	0	5	0	0	90 s	INF	Prof. Dr.-Ing. Wolfgang Schröder-Preikschat	SS	
	M 2.3	Digitale Übertragung / Digital Communications Übung	DÜ / DiCo	3+1+0+0	5	5	0	0	0	90 s	EEL	Prof. Dr.-Ing. habil. Johannes Huber, Prof. Dr.-Ing. Robert Schober	WS: engl SS: dt	
	M 2.4	Signale und Systeme II Übung	SISY II	2,5+1,5+0+0	5	0	5	0	0	90 s	EEL	Prof. Dr.-Ing. André Kaup	SS	
	M 2.5	Computergraphik / Computer Graphics Übung	CG	3+1+0+0	5	5	0	0	0	30 m	INF	Prof. Dr.-Ing. Marc Stamminger, Prof. Dr. Günther Greiner	WS	
	M 2.6	Digitale Signalverarbeitung / Digital Signal Processing Übung	DSV	3+1+0+0	5	5	0	0	0	90 s	EEL	Prof. Dr.-Ing. Walter Kellermann	WS	
	Aufbaumodule / Advanced Modules (A)													
	M 2.7 ¹	Pattern Recognition	PR	3+0+0+0	5	5	0	0	0	30 m	INF	Prof. Dr.-Ing. Joachim Hornegger	WS	
	M 2.8 ¹	Pattern Analysis	PA	3+0+0+0	5	5	0	0	0	30 m	INF	Prof. Dr.-Ing. Elmar Nöth	SS	
	M 2.9	Statistische Signalverarbeitung / Statistical Signal Processing Übung	STASIP	3+1+0+0	5	5	0	0	0	90 s	EEL	Prof. Dr.-Ing. Walter Kellermann	SS	

'Grundcurriculum' /common catalog (for all students)

An updated version is published at the beginning of each semester!

Catalog for each branch of study

Structure – Master Medical Engineering

- **Modules specific to your branch of study:**
 - M 2: Engineering core modules: **20 ECTS**
 - M 3: Medical Engineering core modules: **20 ECTS**
 - M 5: Medical Engineering specialisation modules: **10 ECTS**
- **Modules identical for all students: 70 ECTS**
 - M 1: Medical specialisation modules
 - M 4: Medical engineering core skills (law, economics, ethics)
 - M 6: Medical engineering practical skills
(Academic Laboratory, Research Laboratory)
 - M 7: Flexible budget (any **graded** course offered at FAU)
 - M 8: Master's thesis

Structure – Master Medical Engineering

- Total of 120 ECTS should be evenly spread over four semesters
 - **+/- 30 ECTS per semester**
- Very few compulsory modules (conditional subjects, some mandatory subjects, **see footnotes in catalog!**)
- Mostly free choice within the list for each module group
- Not all lectures are offered in winter and summer (see catalog).
- Recommendation for going abroad: 3th or 4th semester

Types of Courses

- V/L = Vorlesung/lecture – no registration, attendance not mandatory
- Ü/E = Übung/Tutorium; exercise class/tutorial – usually registration in the 1st week, further info in the 1st lecture
- P = Praktikum/Practical course (lab course) – attendance mandatory, early registration – not relevant for 1st semester
- S = Seminar – attendance mandatory, early registration – not relevant for 1st semester

Types of exams/course achievement

- **Prüfungsleistung (PL)/Graded course achievement (gCA)**
 - schriftlich [written]
 - mündlich [oral]
 - Seminar (presentation and paper)
- **Studienleistung (SL)/Ungraded course Achievement (uCA)**
 - e.g. exercise classes or practical courses
 - Hochschulpraktikum/Academic Laboratory
 - Forschungspraktikum/Research Laboratory

Where can I find all the catalogs?

Website of the Medical Engineering program

<http://www.medizintechnik.studium.fau.de/>

→ „Studierende“ → „Master **FPO-Version 2013 – Überblick**“

<http://www.medical-engineering.study.fau.eu/>

→ „Current students“ → General Study Information Master's Program

**Catalogs are updated every semester!
Read the footnotes!**

What else is there to find on the study program website?

<http://www.medizintechnik.studium.fau.de/>

<http://www.medical-engineering.study.fau.eu/>

- **Study Guide**
- Module handbook with content descriptions of each class (generated via UnivIS)
- Further Information: on modules, Master's Thesis, studying abroad, accreditation of coursework etc.
- Links to examination regulations (FPO, APO)
- important forms
- **FAQ-section**

M 8: Master's Thesis

- independent execution of scientific tasks in Medical Engineering
 - ➔ **prepare yourself early on: e.g. lecture „Nailing your thesis“**
(SS+WS)
- Prerequisites: 75 ECTS and completing all conditional subjects
- to be completed within 6 months
- Look for your topic **in due time** (3rd semester, beginning of your last semester at the latest!)
 - **Meaning also: Select your modules with prudence**
- Look for thesis topics on the chair's website/ask for personalized/non-advertised topics at the chairs
- Specific details, formalities, thesis form: Medical Engineering website

Extracurricular Foreign Language Training

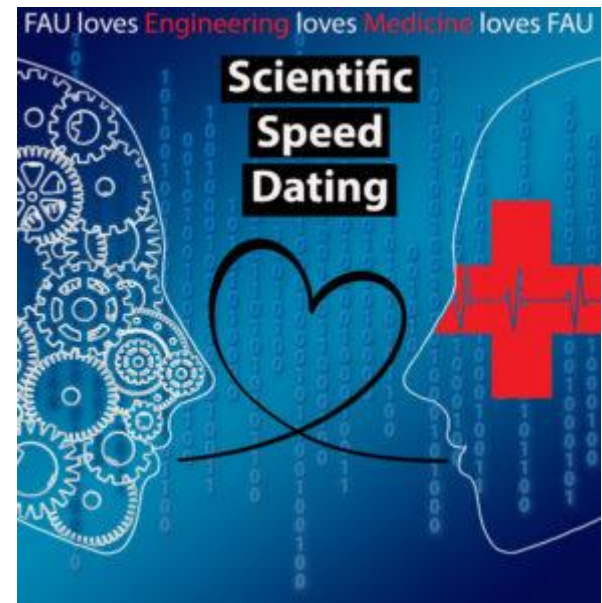
Sprachenzentrum (Language Center), Bismarckstraße 1

www.sz.fau.de

- **Registration** required for all courses
- Registration for **German courses**: online + in person – **open now! Highly recommended for internships & future job!**
- Recommended languages for studying abroad:
e.g. English, Spanish, Portuguese
- Courses also suitable for module group **M7/Flexible budget**

Special course offer in SS 2017: Scientific Speed Dating

- **2,5- 5 ECTS** for Academic Laboratory/Hochschulpraktikum module
- Meet researchers from the Faculty of Medicine and Engineering in a relaxed atmosphere (**April 27th, 6 pm**)
- Find a topic you like and work on a real research project
- **Online registration** on the Medical Engineering website – **last chance today!**
- **More info** – ask me during coffee break.



Online Tools



IdM portal: manage your personal data

- An IdM login is required for nearly all personalized online services at FAU.
- Activate your **IdM Portal** account with the activation password mailed to you → guided session later on
- Problems: Service-counter/“Service-Theke“:
Martensstraße 1, 1st floor

Email address

- A FAU-mail address has been automatically generated for you.
- It is used as default recipient for mails from the university.

To relay: IdM Portal → Services → Click on the address → Field “Relay to“

MeinCampus: manage your exams

- **Login**

- <https://www.campus.fau.de>
- “Single Sign-On”



- **Prüfungen (Exams)**

- Exam Registration/Cancelation (when active – June 5th-23rd)
- See your registered exams
- Overview of Grades/Course Achievements

→ **detailed instructions on the Medical Engineering website**

StudOn: E-learning platform

- Often used for courses that require registration (seminars, practical courses)
- Platform for sharing course materials
- You will be introduced to it later on today.



The screenshot shows the StudOn user interface. At the top left is the StudOn logo. To the right are user avatars and a 'Abmelden' (Logout) button. Below this is a navigation bar with 'Persönlicher Schreibtisch', 'Online-Angebote', and 'Hilfen'. A search bar is also present. The main content area is titled 'Übersicht' and contains a message about hiding sidebars for performance. Below this are three main sections: 'Nachrichten - Letzte 6 Monate' (with a sub-menu for '1-5 von 14 weiter'), 'Ausgewählte Angebote' (listing 'Vorlesung', 'Übungen', 'Berufspädagogik', and 'Einführung in die Erwachsenen- und Weiterbildung'), and 'Kalender' (with an 'iCal' button) and 'Mail' (showing '0 Mail(s)').

What's next?

- 1. Compile your class schedule**
→ UnivIS (guided session later on today)
- 2. Register for courses if needed (info UnivIS), if not required simply go the 1st meeting**
→ Registration: usually via StudOn (see registration link in UnivIS)
- 3. Register for exams** → MeinCampus (June 5th to 23rd)
- 4. Re-Register**
→ Bank info in MeinCampus + bank transfer (first week of July)
- 5. Study & pass exams** → brain, study groups, time management → get old exams from FSI
- 6. Report on your conditional subjects** → Examinations Office (Mrs. Jahreis)

Tips & tricks

1. Be proactive, inform yourself, talk to people, search online.
2. If there is a problem talk to your tutor/lecturer/study advisor ***as soon as possible***.
3. Engage in campus life (student organisations, parties, study groups, buddy program).
4. Take language classes/speak German in daily life.
5. Read the study guide + examination regulations.
6. Read the **footnotes** in your module catalog.
7. Take part in the workshops, summer schools etc. offered/promoted by ZiMT.



Thank you for your attention!

Any questions?

MA MT at FAU | Claudia Barnickel

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- ❑ **Group Quiz: Solutions and Prizes**
- ❑ **Introduction Computer-Pools & Creating your Class Schedule**
(1st floor, blue computer science tower)

12:45-13:45 Lunch break (Mensa)

- ❑ **Guided campus-tour**
(starting point: round bench in front of Mensa, red square)

From 14:15 Get-together with drinks (same bench)