

Medicine & Engineering

Our strong combination at **FAU Erlangen-Nürnberg**

Welcome Master's students
Medical Engineering!

M.Sc. MT at FAU | Claudia Barnickel

ZiMT
ZENTRALINSTITUT FÜR MEDIZINTECHNIK

FAU

FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

- **Welcome by Heike Leutheuser**
(Director Central Institute for Healthcare Engineering /ZiMT)
- **Introduction to the program by Claudia Barnickel**
(Study Coordinator and Advisor Medical Engineering)
- **Welcome by FSI Medizintechnik**
(Student association Medical Engineering)
- **Presentation FAU initiatives**
- **Group quiz: Fun facts about Erlangen and your studies**

~ 11:00 – 11:30 am: Coffee break

- ❑ **Group quiz: Solutions and prizes**
- ❑ **Introduction computer pools & creating your class schedule**

(blue computer science tower, first floor)

~ 1:00-1:45 pm lunch at the canteen (Mensa)

- ❑ **1:45 pm: Guided campus tour**

(starting point: round bench in front of “Mensa”, red square)

from 2:15 pm: get-together with drinks (same bench)

The diversity of Medical Engineering at FAU



by: Tretyakov, Gallery, Moscow

by: Elmovich, Reppin, The surgeon, AM, P.

Growth Market Medical Technology

- **Increase in population and diseases**

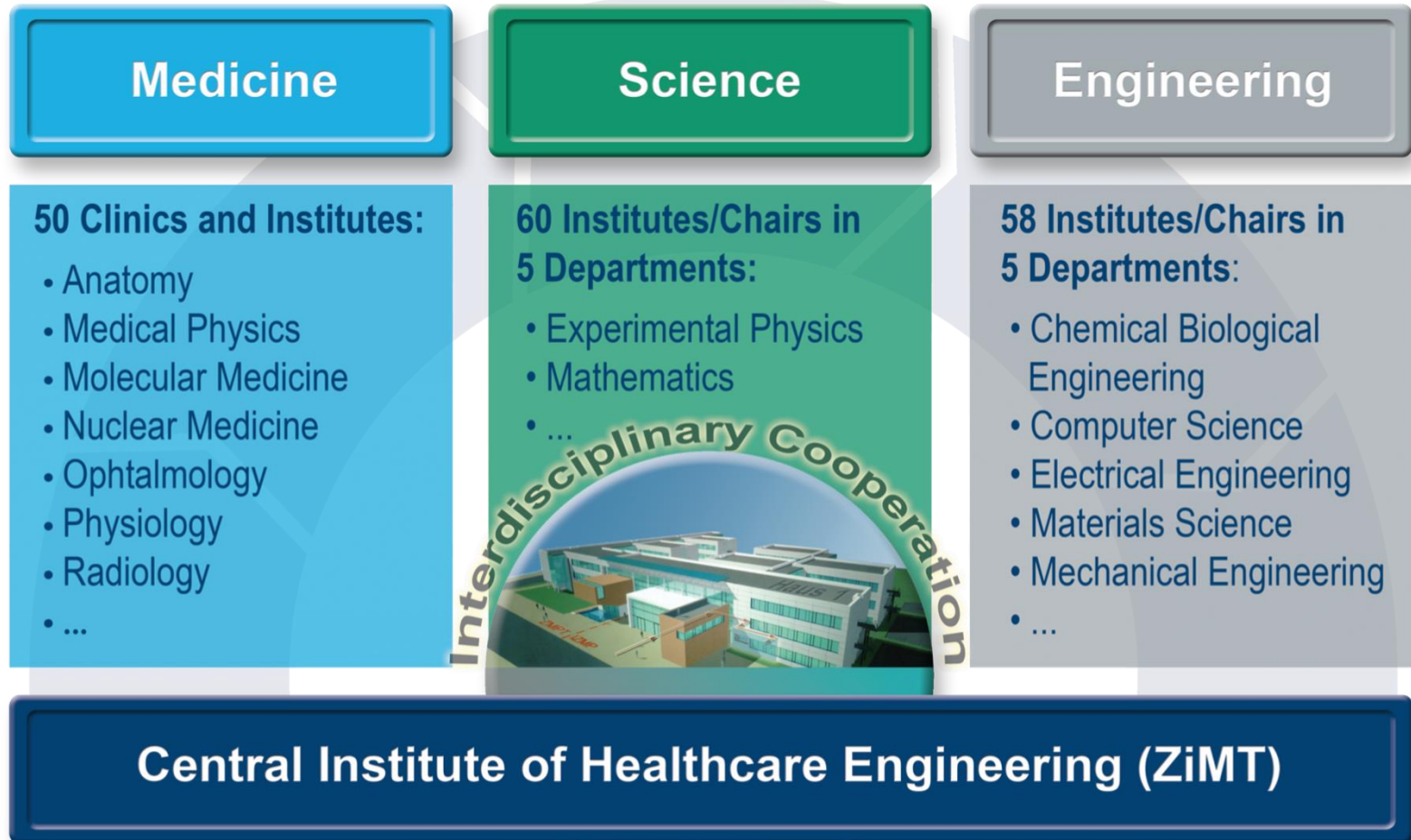
- Demographical development until 2050:
More people, longer life expectancy:

● 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 Director**

(Pattern Recognition Lab/Inf 5)

Prof. Dr.-Ing. Andreas Maier



- **Directors ZiMT**

Dipl.-Phys. Heike Leutheuser

Deputy: Dipl.-Ing. Tobias Zobel



- **Study Coordinator and Advisor**

Claudia Barnickel

blue computer science tower, 2nd floor, room 02.158

Open consultation hours (drop-in):

Mon-Thu, 1-4 pm

Appointments: Claudia.Barnickel@fau.de



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

- **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 (advisor for all engineering programs)
- student visa issues (certificate for foreigners office)

- **Examinations Office Faculty of Engineering**

Prüfungsamt TechFak

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 etc.)
- **report on conditional subjects/“Auflagen“**

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

Christine Mohr

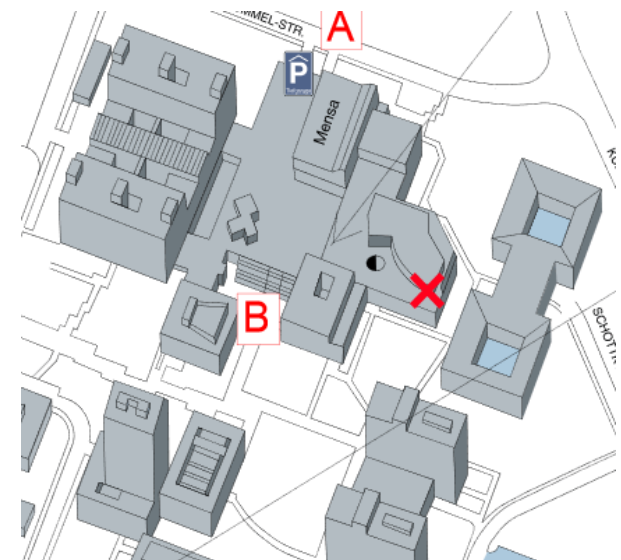
Erwin-Rommel-Str. 60

91058 Erlangen

Room: U 1.250

christine.mohr@fau.de

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



• Career Service

Susanne Winkelmaier, Nicole Jakob, Stefanie Rösch

career-service@fau.de

www.career.fau.de

- Help with your job search
(also student jobs)
- Support with applications
- Check of application documents
- Simulation of job interviews
- 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.)



Psychological support Studentenwerk:

Psychologisch-Psychotherapeutische Beratungsstelle
Computer Science Tower, 4th floor, room 04.154

Open consultation

(anonymous drop-in sessions):

Tue, 1:00 - 2:00 pm

+49 9131 85-27935

Email: elizabeth.provan-klotz@werkswelt.de

Help with exam anxiety, procrastination, loneliness, stress...



Legal advisory service Studentenwerk:

Hofmannstraße 27, 2nd floor, Room 201

See website for consultation hours:

www.werkswelt.de

One URL →

all Medical Engineering services:

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

Too lazy to type URLs? → google “FAU“ + key word

e.g. FAU + language courses

FAU + examinations office

FAU + semester dates...

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 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

- Regular duration of studies: 4 semesters/two years (**can be extended to 5 just by re-registering**)
- 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) – **exception: conditions/”Auflagen” (max. 2 chances = 1 year)**
- 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/severe reasons (medical or other certificate).

Summer semester 2018 (01/04 – 30/09):

Lecture Period:	09/04 – 14/07
Exam Registration: (Reminder via email!)	21/05 – 08/06, 12:00 (noon)
Re-Registration for WS 18/19: (Reminder via email!)	02/07 – 09/07
Semester break (no lectures):	15/07 – 14/10
Exams:	16/07 - 27/07 and 21/09 - 13/10

www.fau.eu/study/current-students/semester-dates/

**Concrete dates for the exams in SS 18: Medical Engineering website →
„Exams“/“Prüfungen“**

Conditional subjects/”Auflagen”

- **Must be passed within one year (deadline: 31/03/19).** Otherwise they will prevent successful re-registration for the 3rd semester. **No exceptions!**
- **After successful completion of conditional subjects: actively inform** Mrs. Jahreis (Examinations Office)
- **Examination results of the 2nd semester might be published late (after the deadline for conditional subjects).**
If this is your case contact Mrs. Jahreis (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 classes and exam also in SS)
- Mathematik A3: WS, exam also in SS (contact lecturer for course materials and study on your own)
- Engineering Mathematics: SS
- Advanced Programming Techniques: lecture, project and exam in WS → **start studying C++ intensively now (e.g. C++ Primer online course)**

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'	Grundlagen der Anatomie & Physiologie für Nichtmediziner	AnaPhys_MIT	4+0+0+0	5	2,5	2,5	0	0	60 s	VORKLIN	Prof. Dr. Clemens Forster	WS/SS	
		Clinical Applications of Optical Technologies and Associated Fundamentals of Anatomy	OMED/CA	4+0+0+0	5		5			45 s	KLIN	Prof. Dr. med. Michael Eichhorn	SS	
	M 1.2	Medizinische Vertiefung 1			5	5	0	0	0	60 s	KLIN	N.N.	WS	
	M 1.3	Medizinische Vertiefung 2			5	0	5	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 Signalverarbeitung		2+0+0+0	2	0	0	0	0	45 s		Prof. Dr. med. habil. Lutz O. Distler	SS	
		Grundlagen der biologischen Systemmodellierung		2+0+0+0	2	0	0	0	0	45 s		Prof. Dr. med. habil. Lutz O. 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			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	0	0	0	0	45 s		Prof. Dr. rer. med. Ulrich Hoppe	WS	
		Cognitive Neurowissenschaften		1+0+0+0	1	0	0	0	0	45 s		Prof. Dr. rer. med. Ulrich Hoppe	WS	
		Augendiagnostik		1+0+0+0	1	0	0	0	0	45 s		Prof. Dr. rer. med. Ulrich Hoppe	WS	
		Augenoperationen		1+0+0+0	1	0	0	0	0	45 s		Prof. Dr. rer. med. Ulrich Hoppe	WS	
		Augenbeteiligung bei Allgemeinerkrankungen		1+0+0+0	1	0	0	0	0	45 s		Prof. Dr. rer. med. Ulrich Hoppe	WS	
		Sehnervmorphologie und Echographie in der Augenheilkunde		1+0+0+0	1	0	0	0	0	45 s		Prof. Dr. rer. med. Ulrich Hoppe	WS	
	M 2 Ingenieurwissenschaftliche Kernmodule													
	Basismodule / Basic Modules (B)													
	M 2.1	Ereignisgesteuerte Systeme	EGS	2+2+0+0	5	5	0	0	0	90 s	INF	Dr.-Ing. Michael Glaß	WS	
		Übung												
	M 2.2	Grundlagen der Systemprogrammierung (Systemprogrammierung 1)	GSP (SP 1)	2+2+0+0	5	0	5	0	0	90 s	INF	Prof. Dr.-Ing. Wolfgang Schröder-Preikschat	SS	
		Übung												
	M 2.3	Digitale Übertragung / Digital Communications	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	
		Übung												
	M 2.4	Signale und Systeme II	SISY II	2,5+1,5+0+0	5	0	5	0	0	90 s	EEL	Prof. Dr.-Ing. André Kaup	SS	
		Übung												
	M 2.5	Computergraphik / Computer Graphics	CG	3+1+0+0	5	5	0	0	0	30 m	INF	Prof. Dr.-Ing. Marc Stamminger, Prof. Dr. Günther Greiner	WS	
		Übung												
	M 2.6	Digitale Signalverarbeitung / Digital Signal Processing	DSV	3+1+0+0	5	5	0	0	0	90 s	EEL	Prof. Dr.-Ing. Walter Kellermann	WS	
		Übung												
	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	STASIP	3+1+0+0	5	5	0	0	0	90 s	EEL	Prof. Dr.-Ing. Walter Kellermann	SS	
		Übung												

'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 at FAU or
VHB/Virtual University Bavaria (VHB only with on-site exam)
 - M 8: Master's thesis

Structure – Master Medical Engineering

- Total of 120 ECTS should be evenly spread over four (or five) semesters, no strict rule but highly recommended:
+/- 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), time slots differ from semester to semester; there might be overlaps
- Recommendation for going abroad: 3rd or 4th semester

Types of Courses

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

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

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

Catalogs are updated every semester (info via email)!

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 (updated every semester)**
- Today's presentation slides
- Module handbook with content descriptions of each course (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) → can be used for Flexible budget
- Prerequisites: 75 ECTS and completing all conditional subjects
- to be completed within 6 months
- Look for your topic **in due time** (end of your penultimate semester at the latest!)
 - **meaning also: select your modules with prudence**
- Look for thesis topics on the lab's website/ask for personalized/non-advertised topics at the labs
- Specific details, formalities, thesis form → Medical Engineering website

Foreign Language Training

Sprachenzentrum (Language Center), Bismarckstraße 1

www.sz.fau.de

- Courses during the lecture period are free of cost
- Intensive courses (with a fee) during the semester break
- **Registration** required for all courses
- Registration for **German courses**: online + in person – **open as of now! Highly recommended for internships & future job!**
- Recommended languages to prepare for studying abroad:
e.g. English, Spanish, Portuguese
- Courses also suitable for module group **M7/Flexible budget**

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“ RRZE (Computer Center): 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 (when active – registration: 21/05 – 08/06), withdrawal from exams until third working day before the exam date
- Overview registered exams
- Overview of grades/acquired ECTS credits

→ **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.



STUDON » Abmelden

Persönlicher Schreibtisch ▾ Online-Angebote ▾ Hilfen ▾ ? [Suche] [Benachrichtigung]

Übersicht

Zur Beschleunigung der Anzeige wurden die Seitenblöcke "Kalender", "Nachrichten" und "Aktive Nutzer" standardmäßig ausgeblendet. Sie können sie selbst über das Menü "Aktionen" rechts neben dieser Überschrift wieder einblenden.

<p>Nachrichten - Letzte 6 Monate (1-5 von 14) weiter</p> <p>Wiki: Wiki für Korrekturen zum Skript Hauptseite 20. Jul 2014, 14:42</p> <p>Forum: Studierendenforum 36 Beiträge hinzugefügt. 18. Jul 2014, 15:10</p> <p>Kurs: Forensische Informatik Es wurden 37 Dateien hinzugefügt. Es wurden 5 Dateien aktualisiert. 10. Jul 2014, 00:57</p>	<p>Ausgewählte Angebote</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;"> Vorlesung</td> <td style="text-align: right; padding: 5px;">Aktionen ▾</td> </tr> <tr> <td style="padding: 5px;"> Übungen</td> <td style="text-align: right; padding: 5px;">Aktionen ▾</td> </tr> <tr> <td style="padding: 5px;"> Berufspädagogik</td> <td style="text-align: right; padding: 5px;">Aktionen ▾</td> </tr> <tr> <td style="padding: 5px;"> Einführung in die Erwachsenen- und Weiterbildung</td> <td style="text-align: right; padding: 5px;">Aktionen ▾</td> </tr> </table>	 Vorlesung	Aktionen ▾	 Übungen	Aktionen ▾	 Berufspädagogik	Aktionen ▾	 Einführung in die Erwachsenen- und Weiterbildung	Aktionen ▾	<p>Kalender</p> <p>iCal</p> <hr/> <p>Mail</p> <p>0 Mail(s)</p>
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 Übungen	Aktionen ▾									
 Berufspädagogik	Aktionen ▾									
 Einführung in die Erwachsenen- und Weiterbildung	Aktionen ▾									

What's next?

- 1. Compile your class schedule**
→ UnivIS (guided session later on today)
- 2. Register for courses if needed (info in UnivIS), if registration is not required simply go the 1st meeting**
→ if registration is required: usually via StudOn (**see registration link in UnivIS**)
- 3. Register for exams** → MeinCampus (**21/05 – 08/06**)
- 4. Re-Register for WS 18/19**
→ Bank info in MeinCampus + bank transfer (**02/07 – 09/07**)
- 5. Study & pass exams** → study groups, time management, practice with old exams from FSI, get advice from our psychologist if needed
- 6. Actively report on your conditional subjects** → Examinations Office (Mrs. Jahreis)

Tips & tricks

1. Be proactive, inform yourself, talk to people, search online. → **Don't be afraid to google, ask, be critical.**
2. If there is a problem talk to your tutor/lecturer/study advisor/psychologic counsellor ***as soon as possible.***
3. Engage in campus life (student organizations, parties, university sports, 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. Build a network through the workshops, summer schools, hackathons etc. offered/promoted by ZiMT.



Thank you for your attention!

Any questions?

M.Sc. MT at FAU | Claudia Barnickel

ZiMT
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