

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 Prof. Andreas Maier**
(Program Director)
- ❑ **Welcome by Heike Leutheuser**
(Director Central Institute for Healthcare Engineering)
- ❑ **Introduction to the program by Claudia Barnickel**
(Study Coordinator and Advisor Medical Engineering)
- ❑ **Welcome by FSI Medizintechnik**
(Student association Medical Engineering)
- ❑ **Presentation FAU initiatives: InnoLab, Digital Tech Academy & Health Hackers**
- ❑ **Group quiz: Fun facts about Erlangen and your studies**

~ 11:10 – 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"/canteen, 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 suspect AM.P.

Growth Market Medical Technology

- **Increase in population and diseases**

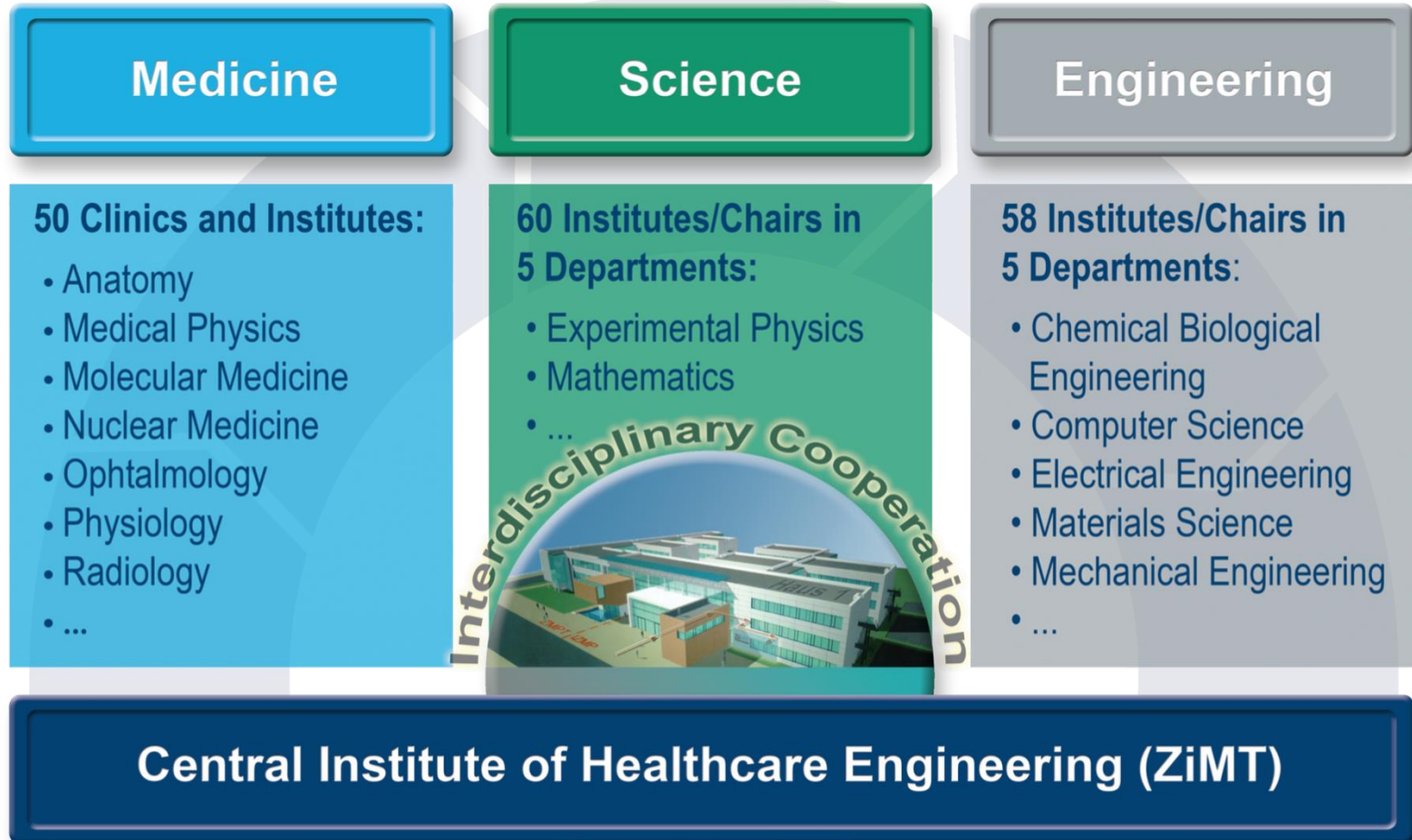
- Demographical development until 2050:
More people, longer life expectancy:

● 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



- **Director ZiMT**

Dipl.-Phys. Heike Leutheuser



- **Study Coordinator and Advisor**

Claudia Barnickel

blue computer science tower, 2nd floor, room 02.158

Open consultation (drop-in without appointment):

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 exams, credits, grades – via our online exam management tool „mein campus“ or via paper certificates („Scheine“)
- withdrawal from exams (illness etc.)
- **report on conditional subjects/“Auflagen“**

- **International Office Faculty of Engineering**

Christine Mohr

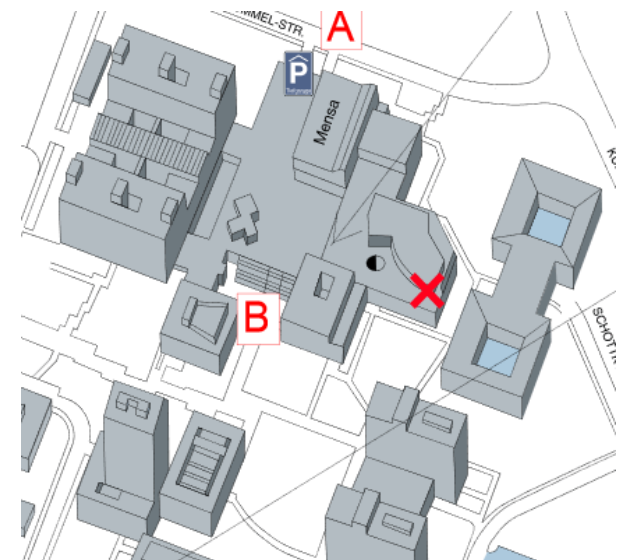
Erwin-Rommel-Str. 60

91058 Erlangen

Room: U 1.250 (basement)

christine.mohr@fau.de

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



- **Career Service**

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.)



- **Advice for students with disabilities and chronic diseases**

Dr. Jürgen Gündel
Schlossplatz 3/Halbmondstr. 6
Room 1.032
91054 Erlangen



- General advice and support (e.g. accessibility of buildings)
- Compensation for disadvantages during examinations (e.g. more time)

Disability: all physical and mental impairments lasting at least 6 months

Chronic diseases: illnesses that require at least one medical treatment per quarter over the course of one year

Psychological support:

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...
- Consultation in German and English



Legal advisory service Studentenwerk:

Hofmannstraße 27, 2nd floor, Room 201

See website for consultation hours:

www.werkswelt.de

One weblink – all medical engineering-related services and info:

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

...including today's presentation!

General info: google “FAU“ + key word

e.g. FAU + language courses

FAU + examinations office

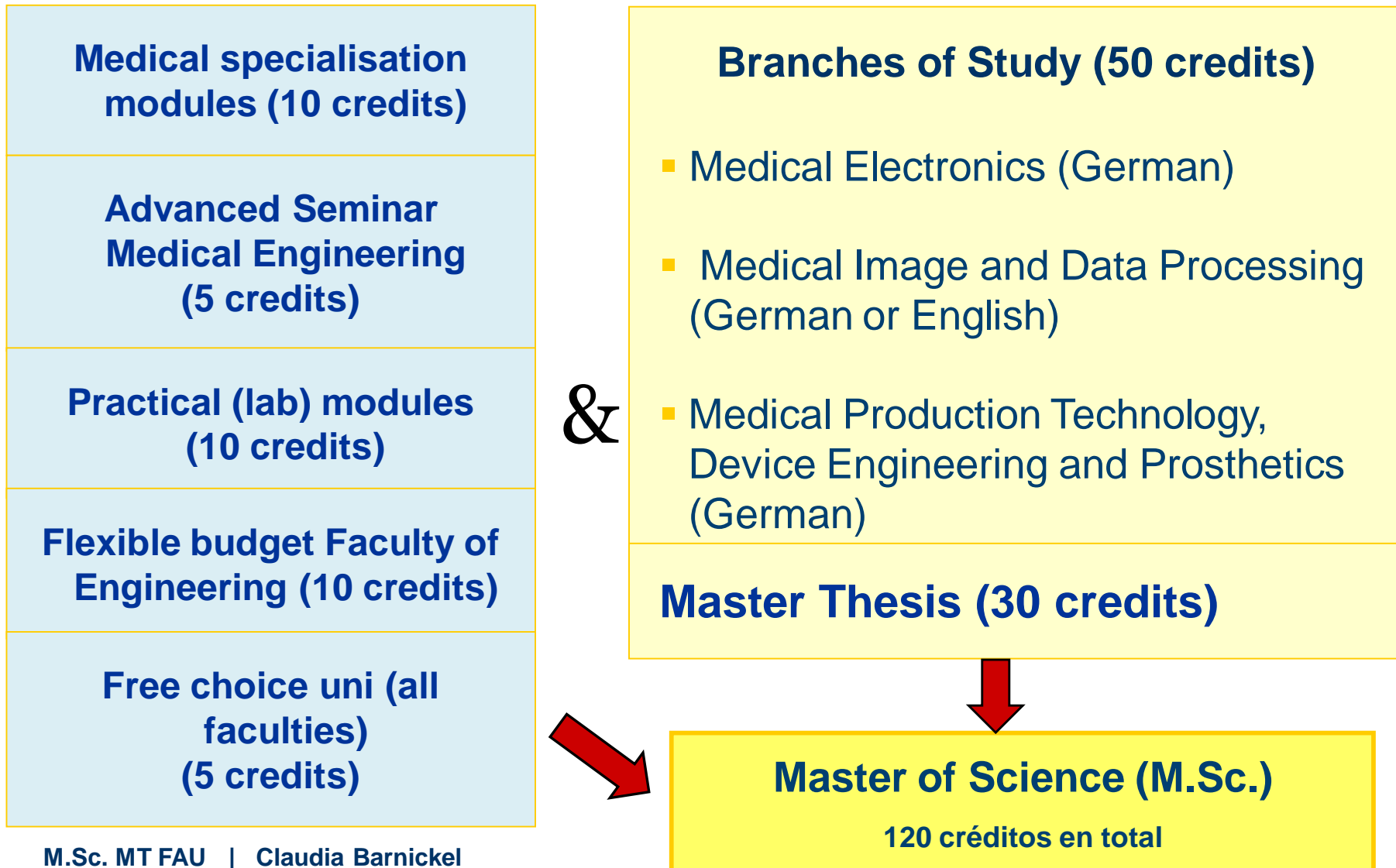
FAU + psychological services

FAU + semester dates...

Program Structure



Structure Master's Program 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 for all students: 70 ECTS**
 - M 1: Medical specialisation modules
 - M 4: Advanced Seminar Medical Engineering
 - M 6: Medical engineering practical modules
(Academic Laboratory, Research Laboratory)
 - M 7: Flexible budget Faculty of Engineering: any **graded** course at the Faculty of Engineering on **Master's level (no conditional subjects)** → see info in UnivIS
 - M 8: Free Choice Uni: any **graded** course at FAU or VHB (**on-site exam**): e.g. language course, **conditional subject**
 - M 9: Master's thesis

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 by re-registering + paying the fee**)
- 1 semester consists of the lecture period (12-14 weeks)+ 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.
- **Withdrawal** 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/other certificate).

Winter semester 2018/19 (01/10/18 – 31/03/19):

Lecture Period:	15/10/18 – 09/02/19
Exam Registration: (Reminder via email!)	19/11/18 – 07/12/18, 12:00 (noon)
Re-Registration for WS 18/19: (Reminder via email!)	01/02/19 – 08/02/19
Semester break (no lectures):	22/12/18 – 06/01/19 10/02/19 – 22/04/19
Exams:	11/02/19 - 23/02/19 and 29/03/19 - 18/04/19

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

Concrete dates for the exams in WS 18/19: Medical Engineering website → „Exams“/“Prüfungen“

Conditional subjects/”Auflagen”

- **Must be passed within one year (deadline: 30/09/19).**
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.**
If this is your case contact you study advisor to get a faster correction.



Conditional subjects/“Auflagen“

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

- Grundlagen der Elektrotechnik II: SS, exam also in WS
- Algorithmen und Datenstrukturen MT: WS (exercise classes and exam also in SS)
- Mathematik A3: WS
- Engineering Mathematics: SS, exam also in WS (contact lecturer for course materials and study on your own)
- Advanced Programming Techniques: WS → help: **C++ Programming online course at the Virtual University Bavaria (VHB): www.vhb.de**

→ Can be used in module M8 (Free Choice Uni)

Master Course Scheme

M1	Medizinische Vertiefungsmodule/Medical specialisation modules gemäß § 44a Abs. 1	10
M2	Ingenieurwissenschaftliche Kernmodule/Engineering core modules gemäß § 44a Abs. 2	20
M3	Medizintechnische Kernmodule/Medical Engineering core modules gemäß § 44a Abs. 3	20
M4	Hauptseminar Medizintechnik/Advanced Seminar Medical Engineering gemäß § 44a Abs. 4	5
M5	Medizintechnische Vertiefungsmodule/Medical Engineering specialisation modules gemäß § 44a Abs. 5	10
M6	Medizintechnische Praxismodule/ Medical Engineering practical modules gemäß § 44a Abs. 6	10
M7	Flexibles Budget Technische Fakultät/Flexible budget Faculty of Engineering	10
M8	Freie Wahl Uni/Free choice Uni	5
M9	Masterarbeit/Master's thesis	30
Summe ECTS-Punkte		120

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

Typ	Modulnummer	Modulbezeichnung (Veranstaltungsname)	Abkürzung	V+Ü+S+P	ECTS				Studien- und Prüfungsleistungen	Department	Modulverantwortlicher / Dozent	WS/SS	
					gesamt	1. Jahr	2. Jahr	3. Jahr					
					WS	SS	WS	SS					
M 1 Medizinische Vertiefungsmodule													
	M 1.1'	Grundlagen der Anatomie & Physiologie für Nichtmediziner	AnaPhys_MT	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 Bildung		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 Signalverarbeitung		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 / Strahlentherapie											
		Cognitive Neurowissenschaften											
		Augendiagnostik											
		Augenoperationen											
		Augenbeteiligung bei Allgemeinerkrankungen											
		Sehnervmorphologie und Echographie in der Augenheilkunde											
	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				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 every semester!

Catalog for each branch of study

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
- Few compulsory modules (conditional subjects, some mandatory subjects in the catalog, **see footnotes!**)
- 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 time overlaps (→ video lectures: www.video.fau.de)
- Recommendation for going abroad: 3rd or 4th semester (start planning now)

Types of Courses

- V/L = Vorlesung/lecture – generally no registration, attendance not mandatory
- Ü/E = Übung/Tutorium; exercise class/tutorial – start in the 2nd week, 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 → Überblick und Modulkataloge
FPO 2018

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

→ Current students → General Study Information Master's
Program → General Study Information & Course Syllabus
(FPO 2018)

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
- exam dates
- **FAQ-section**

M 9: Master's Thesis

- independent execution of scientific tasks in Medical Engineering
 - ➔ **prepare yourself early on:** e.g. lecture „Nailing your thesis“(SS) → can be used for Flexible Budget Faculty of Engineering
- Prerequisites: 75 ECTS, completing all conditional subjects and mandatory modules (footnotes!)
- to be completed within 6 months
- Look for your topic **in due time** (end of your penultimate semester at the latest!)
 - **select your modules in preparation of your thesis topic**
- Look for thesis topics on the lab's websites/ask for personalized/non-advertised topics at the labs (professor, PhD students)
- 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 **M8/Free Choice Uni**

Online Tools



IdM portal: www.idm.fau.de 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
- Upload a photo to generate your student ID – will be sent to your semester address
- Problems: Service-counter/“Service-Theke“ RRZE (Computer Center): **in this building** (Martensstraße 1), 1st floor

IdM portal: www.idm.fau.de manage your personal data!

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 → Self Service → Email → Click on the “...”-button → Field “Relay to“
- **All important info regarding your studies will be sent to your FAU mail!**

MeinCampus: manage your exams

- **Login**

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



- **Prüfungen (*Exams*)**

- exam registration (when active – registration: 19/11/18 – 07/12/18)
- 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.



The screenshot shows the StudOn user interface. At the top left is the StudOn logo. To the right are user avatars and a link to 'Abmelden'. Below this is a navigation bar with 'Persönlicher Schreibtisch', 'Online-Angebote', and 'Hilfen'. A search bar is on the right. The main content area is titled 'Übersicht' and contains a message about hidden sidebars. Below are three main sections: 'Nachrichten' (messages), 'Ausgewählte Angebote' (selected offers), and 'Kalender' (calendar). The 'Nachrichten' section lists recent updates from a wiki, forum, and course. The 'Ausgewählte Angebote' section lists 'Vorlesung', 'Übungen', 'Berufspädagogik', and 'Einführung in die Erwachsenen- und Weiterbildung'. The 'Kalender' section shows 'iCal' and 'Mail' (0 Mail(s)).

What's next?

- 1. Compile your class schedule**
→ UnivIS (guided session later on today)
- 2. Register for courses - only 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 (**19/11/18 – 07/12/18**)
- 4. Re-Register for WS 18/19**
→ bank transfer - info via email (**01/02/19 – 08/02/19**)
- 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. → **Google, read, ask.**
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 organisations, 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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FAU

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