

# Medicine & Engineering

Our strong combination at FAU Erlangen-Nürnberg

## Welcome, Master Students of Medical Engineering!

Master Welcome Day, Oct. 8, 2019  
Felix Schmutterer & Tino Haderlein



- ❑ **Welcome by Prof. Björn Eskofier**  
(Program Director)
- ❑ **Welcome by Dr. Heike Leutheuser**  
(Director of the Central Institute for Medical Engineering)
- ❑ **Introduction to the Study Program**  
(Study Coordinators for Medical Engineering)
- ❑ **Welcome by FSI Medizintechnik**  
(Student Association Medical Engineering)
- ❑ **Coffee Break**
- ❑ **Introduction to Computer Pools & Creating Your Class Schedule**  
(blue computer science tower, room 01.155)
- ❑ **Guided Campus Tour and Get-Together**

# 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**



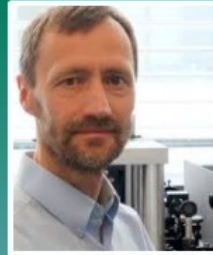
# Central Institute of Medical Engineering (ZiMT)



Prof. Dr. med. Dr. h. c.  
Jürgen Schüttler

## Medicine

65 Clinics, Chairs and  
Institutes



Prof. Dr. Ben Fabry

## Science

60 Chairs in 5  
Departments



Prof. Dr. Björn Eskofier

## Engineering

58 Chairs in 5  
Departments

Central Institute of Medical Engineering

# Persons in Charge Contact Persons



# MedTech Representatives

- **Program Director**  
**(Machine Learning & Data Analytics)**  
Prof. Dr. Björn Eskofier
  
- **Director of ZiMT**  
Dr.-Ing. Heike Leutheuser



- **Study Coordinators**

**PD Dr. Tino Haderlein**

**Dr. Felix Schmutterer**



blue computer science tower (Martensstr. 3), room 02.158

**Open consultation (drop-in without appointment):**

**Mon–Thu, 1–4 p.m.**

Appointments: [Studienberatung-Medizintechnik@fau.de](mailto:Studienberatung-Medizintechnik@fau.de)

- advice for your studies
- accreditation of coursework achievements
- support with formalities
- all kinds of questions regarding your studies



- **General Study Advisory** (Informations- und Beratungszentrum, IBZ)  
**Elisabeth Bächle-Grosso**, Halbmondstr. 6-8, 91054 Erlangen, Room: 1.031  
[elisabeth.baechle-grosso@fau.de](mailto: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; **‘Technical Faculty’ = Faculty of Engineering**)  
**Helga Jahreis**, Halbmondstr. 6, 91054 Erlangen, Room: 1.042,  
[helga.jahreis@fau.de](mailto:helga.jahreis@fau.de)
  - managing exams, credits, grades online by ‘mein campus’ or by paper certificates (‘Scheine’)
  - withdrawal from exams (due to 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](mailto:christine.mohr@fau.de)

- Information about studies/internship abroad
- General help and support for international students

## ● Career Service

[career-service@fau.de](mailto:career-service@fau.de) ; [www.career.fau.de](http://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](mailto:gender-und-diversity@fau.de)

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

## ● Advice for Students with Disabilities or Chronic Diseases

Dr. Jürgen Gündel, Schloßplatz 3/Halbmondstr. 6, 91054 Erlangen, Room: 1.032, [juergen.guendel@fau.de](mailto:juergen.guendel@fau.de)

→ General advice and support (e.g. accessibility of buildings)

→ Compensation of disabilities 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, Martensstr. 3, 91058 Erlangen, Room: 04.154

**Open consultation (anonymous drop-in sessions):**

**Mon, 2:00–4:00 p.m.**

+49 9131 85-27935

E-Mail: [elizabeth.provan-klotz@werkswelt.de](mailto: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](http://www.werkswelt.de)

# How to Find Information

**Weblink for all medical engineering-related services and information:**

- [www.medical-engineering.study.fau.eu](http://www.medical-engineering.study.fau.eu)
- [www.medizintechnik.fau.de](http://www.medizintechnik.fau.de)

**...including today's presentation!**

# How to Find Information

**General information on the internet:  
search the web for 'FAU' + key word**

e.g. FAU + language courses

FAU + examinations office

FAU + psychological services

FAU + semester dates...

# Master's Program Medical Engineering Program Structure





# What is ECTS?

- ***European Credit Transfer and Accumulation System***  
Assessment of student workload required for the learning outcomes of a program
  - 30 credits: **recommended** workload per semester
  - 1 credit:  $\approx 30$  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

# Master's Program Medical Engineering: Structure

**Medical specialisation  
modules (10 credits)**

**Advanced Seminar  
Medical Engineering  
(5 credits)**

**Practical (lab) modules  
(10 credits)**

**Flexible budget Faculty of  
Engineering (10 credits)**

**Free choice Uni  
(all faculties)  
(5 credits)**

## Branches of Study (50 credits)

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

## Master's Thesis (30 credits)

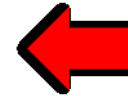
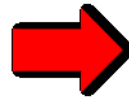
## Master of Science (M. Sc.)

120 credits in total



- **Modules for all students: 70 credits**
  - M 1: Medical specialisation modules (10 cr.)
  - M 4: Advanced seminar Medical Engineering (5 cr.)
  - M 6: Medical engineering practical modules (academic laboratory, research laboratory; 10 cr.)
  - M 7: Flexible budget Faculty of Engineering (10 cr.): any **graded** course at the Faculty of Engineering on **Master's level** → see info in UnivIS
  - M 8: Free Choice Uni (5 cr.): any **graded** course at FAU or VHB (**on-site exam**): e.g. language course ...
  - M 9: Master's thesis (30 cr.)
- **Modules specific to your branch of study: 50 credits**
  - M 2: Engineering core modules (20 cr.)
  - M 3: Medical Engineering core modules (20 cr.)
  - M 5: Medical Engineering specialisation modules (10 cr.)

# 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

# Master Program Medical Engineering: Structure

- Total of 120 ECTS credits **should** be evenly spread over four (or five) semesters; no strict rule but **highly recommended: ≈30 ECTS credits per semester**
- Few compulsory modules (conditional subjects, some mandatory subjects in the catalog, **see footnotes there!**)
- Mostly free choice within the list for each module group
- Not all lectures are offered in winter and summer (see catalog), time slots may differ from semester to semester; there might be time overlaps  
(→ video lectures: [www.video.fau.de](http://www.video.fau.de))
- Recommendation for going abroad: 3<sup>rd</sup> or 4<sup>th</sup> semester (start planning now)

# Semesters & Exams

- Regular duration of studies: 4 semesters/two years  
(**can be extended to 5 by re-registering + paying the fee**)
- Semester: lecture period (14 or 15 weeks) +  
lecture-free period ('semester holidays', ≈12 weeks)
- Two exam periods: first 2 weeks and last 3 weeks  
**of the lecture-free period**
- Failing an exam: **2<sup>nd</sup> + 3<sup>rd</sup> chance** in the **following** two  
semesters (**mandatory** registration) – **exception:**  
**conditions/'Auflagen'** (max. 2 chances, i.e. 1 year!)
- You can/must only take exams if you **register** for them.
- **Withdrawal** from registered exams: until 3 working days  
(Mon – Fri) before the exam without a reason – or later in  
case of illness/severe reasons (medical/other certificate)

# Semesters & Exams

**Winter semester 2019/20 (Oct. 1, 2019 – March 31, 2020):**

Lecture Period: **Oct. 14, 2019 – Feb. 7, 2020**

Exam Registration: **Nov. 18, 2019 – Dec. 6, 2019, 12:00  
(noon; Reminder via e-mail!)**

Re-registration for Summer 2020: **Feb. 3 – 10, 2020  
(Reminder via e-mail!)**

Semester break (lecture-free): **Feb. 8 – April 19, 2020**

Exams: **Feb. 10 – 22 and March 26 – April 18, 2020**

**[www.fau.eu/study/current-students/semester-dates/](http://www.fau.eu/study/current-students/semester-dates/)**

**Exact dates for the exams in Winter 2019/20:  
Medical Engineering website → 'Exams'/'Prüfungen'**

## Conditional Subjects/‘Auflagen’

- **Must be passed within one year (deadline: Sept. 30, 2020).**  
Otherwise they will prevent successful re-registration for the 3<sup>rd</sup> semester. **No exceptions!**
- **After successful completion of conditional subjects: Actively inform** Mrs. Jahreis (Examinations Office)!
- **Examination results of the 2<sup>nd</sup> semester might be published late.**  
If this is your case, contact your lecturer to get a faster correction.



## Conditional Subjects/‘Auflagen’

**Lectures that are usually offered only once a year in summer semester (SS) or winter semester (WS):**

- Grundlagen der Elektrotechnik II: SS, exam also in WS
  - Algorithmen und Datenstrukturen für 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 → preparation in summer: **C++ Programming online course at the Virtual University Bavaria (VHB): [www.vhb.de](http://www.vhb.de)**
- can be used in module group M8 (Free Choice Uni)**

# Types of Courses

- V/L: Vorlesung/lecture – generally no registration, attendance not mandatory
- Ü/E: Übung/tutorium; exercise class/tutorial – usually start in the 2<sup>nd</sup> week, further details in the 1<sup>st</sup> lecture, attendance usually not mandatory
- P: Praktikum/practical course (lab course) – attendance mandatory, early registration (see UnivIS) – not relevant for 1<sup>st</sup> semester
- S: Seminar – attendance mandatory, early registration (see UnivIS) – not relevant for 1<sup>st</sup> 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

# Module Catalogs (Available on the Webpage)

Typ	Modulnummer	Module		V+Ü+S+P	Gesamt				Studien- und Prüfungsleistungen	Department	Modulverantwortlicher / Dozent	WS/SS	
		Modulbezeichnung (Veranstaltungsname)	Abkürzung		WS	SS	WS	SS					
<b>Medizinische Vertiefungsmodule</b>													
				V+Ü+S+P	10	5	5	0	0	PL			
	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
	<b>Liste der Lehrveranstaltungen für M1.2 bzw. M1.3</b>												
		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 Stromerzeugung		4+0+0+0	5	5	0	0	0	60 s		Prof. Dr. med. habil. Christoph Distler	SS
		Grundlagen der biologischen Stromerzeugung		2+0+0+0	2,5	2,5	0	0	0	45 s		Prof. Dr. med. habil. Christoph 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 der Diagnostik			10	5	5	0	0				
		Cognitive Neurowissenschaften											
		Augendiagnostik											
		Augenoperationen											
		Augenbeteiligung bei Allgemeinerkrankungen											
		Sehnervmorphologie und Echographie in der Augenheilkunde											
	<b>M 2 Ingenieurwissenschaftliche Kernmodule</b>												
		<b>Basismodule / Basic Modules (B)</b>			V+Ü+S+P	20	10	10	0	0	PL		
	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											
	<b>Aufbaumodule / Advanced Modules (A)</b>												
	M 2.7'	Pattern Recognition	PR	3+0+0+0	5	5	0	0	0	30 m	INF	Prof. Dr.-Ing. Joachim Hornegger	WS
	M 2.8'	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  
except HMDA)**

**An updated version is published at  
the beginning of every semester!**

**Catalog for each  
branch of study**

## Where can I find all the catalogs?

### Website of the Medical Engineering programme:

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

→ Studierende → Master → Überblick und Modulkataloge  
FPO 2019

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

→ Current students → General Study Information Master's  
Program → General Study Information & Course Syllabus  
(FPO 2019)

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

## What else is on the study programme website?

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

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

- **Study Guide (updated usually every semester) DELAYED**
- Today's presentation slides
- Module handbook with content descriptions of each course (generated via UnivIS) **DELAYED**
- Further information: on modules, Master's Thesis, studying abroad, accreditation of coursework etc.
- Links to examination regulations (FPO, ABMPO)
- 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 (M 7)
- Prerequisites: 75 ECTS credits, completing all conditional subjects and mandatory modules (footnotes in catalogs/exam regulations!)
- 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 labs' 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](http://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

**m** mein campus

— **STUDON** —

**UnivIS**

**IdM-Portal**



## IdM portal: [www.idm.fau.de](http://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.
- Upload a photo to generate your student ID card – **it will be sent to your semester address!**
- Problems: service counter/‘Service-Theke’ RRZE (Computation Center): next to blue computer science tower (Martensstraße 1), 1<sup>st</sup> floor

# IdM portal: [www.idm.fau.de](http://www.idm.fau.de) Manage your personal data!

## E-mail Address

- An FAU e-mail address has been generated for you.
- It is used as default recipient for e-mails from the university.  
**To relay: IdM Portal → Self Service → Email → Click on the “...”-button → Field “Relay to”**
- **All important information regarding your studies will be sent to your FAU e-mail address!**

# MeinCampus: Manage Your Exams

- **Login**

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



- **Prüfungen (Exams)**

- Exam registration  
(when active – registration: Nov. 18 – Dec. 6, 2019)
- Withdrawal from exams **until three working days** before the exam date (Mon–Fri)
- Overview of registered exams
- Overview of grades and acquired ECTS credits

**Detailed instructions: see Medical Engineering website**

# StudOn: E-learning Plattform

- <https://www.studon.fau.de>
- Often used for courses that require registration (seminars, practical courses)
- Platform for sharing course materials

The screenshot shows the StudOn user interface. At the top, there is a navigation bar with the StudOn logo, a search bar, and a 'Abmelden' (Logout) button. Below the navigation bar, there is a section titled 'Übersicht' (Overview) with a message indicating that certain sidebars are hidden for performance reasons. The main content area is divided into three columns:

- Nachrichten - Letzte 6 Monate** (1-5 von 14) weiter: A list of recent messages, including a Wiki update for 'Wiki für Korrekturen zum Skript Hauptseite' (20. Jul 2014, 14:42), a forum post 'Forum: Studierendenforum 36 Beiträge hinzugefügt.' (18. Jul 2014, 15:10), and a course update 'Kurs: Forensische Informatik Es wurden 37 Dateien hinzugefügt. Es wurden 5 Dateien aktualisiert.' (10. Jul 2014, 00:57).
- Ausgewählte Angebote**: A list of selected offers, each with a folder icon and an 'Aktionen' (Actions) dropdown menu. The offers are: 'Vorlesung', 'Übungen', 'Berufspädagogik', and 'Einführung in die Erwachsenen- und Weiterbildung'.
- Kalender**: A calendar section with an 'iCal' button. Below it is a 'Mail' section showing '0 Mail(s)'.

# What's next?

## 1. Compile your class schedule

→ UnivIS (guided session later on today)

## 2. Register for courses – only if needed (**information in UnivIS**):

usually via StudOn (**see registration link on the respective lecture page in UnivIS**)

If registration is not required, simply go the first meeting.

## 3. Register for exams → MeinCampus (**Nov. 18 – Dec. 6, 2019**)

## 4. Re-register for Summer 2020

→ bank transfer – details via **e-mail (t.b.a.)**

## 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. → **Search, read, ask.**
2. **Read the study guide + examination regulations.**
3. **Read the footnotes in your module catalog.**
4. If there is a problem, talk to your tutor/lecturer/study advisor/psychologic counsellor **as soon as possible.**
5. Engage in campus life (student organisations, parties, university sports, study groups, buddy program).
6. Take language classes/speak German in daily life.
7. Build a network through the workshops, summer schools, hackathons etc. offered/promoted by ZiMT.

Thank you very much!

