Master's Degree Program

Medical Engineering



Study Guide SS 22

Preface

This study guide is meant as a handbook for the Master's students of Medical Engineering at the Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) to help them find their way through the sometimes confusing academic life. It is primarily directed towards students completing their studies according to the examination regulations for Medical Engineering/FPO version 2019 (study start: 1st October 2019 or later). Master's students of older examination regulations (FPO version 2013 or 2018) can also find useful information in this study guide but should consult the regulations that apply to them on the Medical Engineering homepage.

All facts and information were put together thoroughly and worded with great care. However, only the examination regulations for Medical Engineering (FPO) and the generalexamination regulations for the Bachelor's and Master's degree programs at the Faculty of Engineering (ABMPO TechFak) form the legally binding basis for all study-related issues.

If you are unsure about some technical terms and abbreviations used, you can consult the glossary at the end of this study guide. In the last chapters you can also find explanations of online tools relevant for your studies and information of all contacts mentioned.

The whole Medical Engineering team wishes you fun and success with your studies!

Claudia Barnickel

Study Advisory Medical Engineering

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1 First Orientation

1.1 What is Medical Engineering?

The fast-paced progress in medicine pushes the medical engineering sector to search for innovative developments and improved processes. This concerns the imaging techniques applied in the process of diagnosing and treating patients, e.g. computed tomography (CT) or magnetic resonance imaging (MRI) as well as the constant improvements of highly complex technical equipment such as x-ray systems, radiation therapy units and surgical robots. A third trendsetting area is the research of new materials (e.g. artificial bone) used for implants (e.g. hip implants) and prosthetics.

This broad spectrum of requirements demands great efforts from researchers. Research teams consist more and more of experts of various fields and require a vast cooperation of medicine, computer sciences, electrical engineering, mechanical engineering and materials sciences to meet the manifold demands. Medical engineering companies and research centers therefore seek engineering specialists who have an interdisciplinary background, a request answered by the Medical Engineering study program.

1.2 Careers in Medical Engineering

Which jobs are suitable for graduates of Medical Engineering?

Our graduates work in research and development, sales or service and maintenance of complex medical equipment and units, as well as in training and counseling on medical engineering issues. Prospective employers can be found in academic research, private businesses, healthcare institutions, consulting companies and public health agencies. The specific job opportunities can be divided in four work environments:

In **hospitals** and **laboratories**, medical engineers are responsible for the entire equipment and ensure that devices and units are fit to operate. The area of work might include fields like intensive care, nuclear medicine and the central data acquisition and processing including its extensive monitoring system and storage procedures. Being experts for the technical devices, medical engineers work mostly independently from the hospital staff, but must remain in close communication with doctors and patients.

First Orientation

In **research institutions** or the **development laboratories** of industrial manufacturers, medical engineers test devices for new examination methods, analyzing their functions and comparing them to already existing methods. They can also be in charge of clinical examinations and risk assessments.

In larger **medical practices** (e.g. in dialysis centers) medical engineers supervise the equipment, ensure its operability and instruct medical practitioners on equipment issues and the testing of new devices.

Medical engineers can also operate in **sales** and **consulting**. The highly specialized medical devices require the experts in these areas to be properly trained in the field of engineering, to possess basic knowledge in medicine and to fully understand the general and specific technology. Our graduates also have the possibility to work as consultants on medical products or as product managers.

What does the job market offer for medical engineers?

The job perspectives in medical technology are promising for medical engineers. Experts state that the demand for engineers and scientists will continue to increase, due to the success of German medical engineering companies on the world market.

The industry is looking for well-educated personnel not only for research and development but also for questions of authorization and registration. The path of medical devices from their conception to the launch on the market is becoming increasingly more complex and demands improvement of the know-how and personnel resources within a company.

The income potential of graduates is attractive and comparable to the earnings in the pharmaceutical industry. The excellent opportunities for career building and the increasing internationalization of medium-sized medical engineering businesses facilitate a fortunate salary development.

(sources: bvmed.de; spectaris.de)



1.3 Medical Engineering at FAU

1.3.1 General Information

The Bachelor's degree program Medical Engineering was launched in winter semester 2009/10 and the two-year Master's degree program Medical Engineering started in winter semester 2011/2012. The principles of our degree program consist of providing a thorough education in engineering, incorporating the benefits of our specific location in the Medical Valley of the Nuremberg Metropolitan Region and promoting international and interdisciplinary studies. The Central Institute of Medical Engineering (ZiMT) and the Study Commission for Medical Engineering of FAU's Faculty of Engineering determine the concept and organization of the study program. We would like to emphasize not only our close cooperation with different departments of the University Hospital in Erlangen, but also the variety of our contacts with external partners, e.g. companies of all scales, medtech hubs, associations, research facilities and other universities. The integration of our study program into national and international networks (such as EIT Health) makes it meet the current research demand and the expectations of future employers.

Almost 1000 students are currently enrolled in our Bachelor's and Master's degree program. Since the launch of our degree program, the student numbers have increased continuously, as Figure 1 indicates. The balanced gender ratio is remarkable for a study program in the field of engineering.

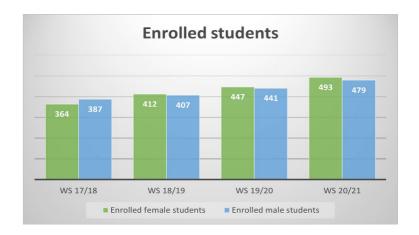


Figure 1: Development of the student numbers (Bachelor's and Master's) since 2017



1.3.2 Structure and Objectives of Master's Degree Program

The research-oriented Master's degree program is designed to complement the interdisciplinary education of the Bachelor's degree and prepares the graduates for working as engineers on the highest scientific level. The studies build on the knowledge acquired during the Bachelor's degree program in mathematics, algorithmics and engineering. This allows for both specialization and broad employability across disciplines.

The Master's degree program offers five branches of study: "Medical Image and Data Processing" (can be studies entirely in English), "Medical Electronics" (in German), "Medical Device Engineering, Production Technology and Prosthetics" (in German), "Health & Medical Data Analytics and Entrepreneurship"/HMDA (in English) and our newest specialization "Medical Robotics" (from winter semester 22/23 on, in English). Our students gain deep technical knowledge in their chosen engineering field with a clear focus on problem solving and application methods in their respective area of medical engineering.

Through our close cooperation with the University Hospital and our Faculty of Medicine, students have the opportunity to learn about medical processes and anatomic-physiological connections and develop medical terminology skills. Additionally, they can prepare themselves to face the regulatory, ethical and economic issues of the medical engineering sector by attending classes on medical device law, ethics, health economics and business creation within the soft skills section of their studies.

Another key element of the study program is the interdisciplinary Master's thesis, the super-vision of which is conducted by members of both the Faculties of Engineering and Medicine or a compatible medical facility.

1.3.2.1 Requirements of the Study Program

Who is suitable for the study program?

The study program is directed towards prospective students with a technical and scientific (especially mathematical) understanding and teaches technical problem-solving competences for hands-on medical applications. Therefore, you will not only need extensive knowledge in **mathematics** but also proficiency in **electrical engineering** and **computer science**. Accompanying the engineering studies, basic medical knowledge (anatomy, physiology, and biochemistry) is incorporated into the study plan. Due to the broad technical spectrum and the simultaneous specialization, great

commitment is required to master this challenging degree. The interdisciplinary nature of the studies requires open-mindedness across disciplines, excellent communication skills and an interest in diverse subjects. Endurance while handling complex tasks and organizational skills are key. In exchange, you gain the opportunity to enter an exciting prospective job field.

2 Master's Program Medical Engineering

2.1 Overview

The standard duration of studies for the Master's program Medical Engineering amounts to four semesters. Students must indicate in their application one of the five possible branches of study: "Medical Image and Data Processing" (in German or entirely in English), "Medical Electronics" (in German), "Medical Device Engineering, Production Technology and Prosthetics" (in German), "Health & Medical Data Analytics and Entrepreneurship"/HMDA (in English) or "Medical Robotics" (in English). The Master's study plan is very flexible except for a few compulsory subjects; students may design their plan individually according to their branch of study. Practical knowledge is gained through an academic laboratory (laboratory training class) and a research laboratory carried out at one of the chairs involved in the program. In the "Flexible Budget Faculty of Engineering" module, students are free to take any module offered on Master's level at the Faculty of Engineering. In the "Free Choice Uni" module, students can take non-engineering-related courses. The exams take place after each lecture period, right at the beginning and at the end of the semester break. The fourth semester is designated for the Master's thesis. In order to successfully complete the Master's degree program, 120 ECTS points must be acquired. Upon completion, the academic title Master of Science (M.Sc.) is awarded.

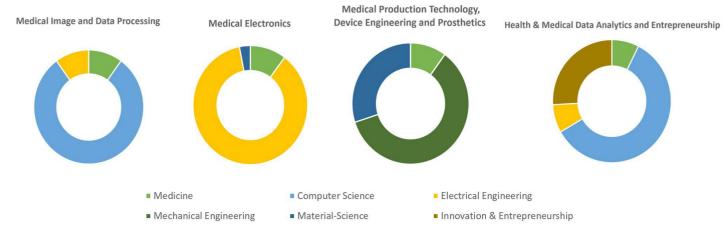


Figure 2: Subject distribution within the Master's branches of study (without "Medical Electronics")



2.2 Before Beginning your Studies

2.2.1 Admission Requirements

To successfully apply for the Master's degree program Medical Engineering, you must have a subject-specific or subject-related Bachelor's degree.

The subject-related Bachelor's degrees must be **exclusively from the field of engineering**, e.g.:

- (potentially) (Bio-)Medical Engineering degrees from other universities
- Electrical/Electronic/Communication Engineering
- Computer Science
- Mechanical Engineering
- Engineering for Teaching
- Computational Engineering
- Information and Communication Technology
- Mechatronics
- Information Systems
- Industrial Engineering

A degree in a non-engineering field (e.g. Medicine or Biochemistry) does not meet the admission requirements for the Master's degree program Medical Engineering.

We cannot give you a general statement on how your chances for admission are. We must analyze your application and determine whether your Bachelor's degree is subject-related compared to the consecutive applicants (applicants with a Bachelor's degree in Medical Engineering from FAU), whether possible discrepancies can be balanced through certain conditions (applicable for subject-related degrees) or if your subject knowledge does not meet the standards of the degree program. If applying from abroad, your grades and credits must be converted into the German system. In order to get a general idea whether the program is suitable for you, we highly recommend that you take our online self-assessment test.



2.2.2 Application

The application for the Master's can only be entered via the online portal <u>Campo</u>, which is available in German and English.

The application deadline for the winter semester is **July 15th** and for the summer semester it is **January 15th**. **Non-EU applicants should hand in their application as soon as possible in order to have enough time to apply for their visa after being accepted.** Please note that the HMDA branch can only be started in winter.

The following documents must be submitted with your application (only online via our application portal Campo, it is not necessary to submit hard copies via post):

- Certificate of secondary education (e.g. high school diploma)
- Certificate of university degree, diploma supplement (if already available)
- Transcript of records
- Personal data sheet (= CV)
- Letter of motivation (one DIN A4 page)
- If the language of instruction is not your native language a language certificate is required:
 - either for German: DSH 2 or equivalent
 (https://www.fau.eu/education/international/from-abroad/application-and-enrollment/german-language-skills-and-certificates/)
 - or English: internet based TOEFL: at least 80, paper based TOEFL: at least 547, computer based TOEFL: at least 210, IELTS: at least 5.5, Cambridge Certificate in English(FCE) or Business English Certificate (BEC) Vantage, UNIcert III
- If you haven't completed your Bachelor's studies and **do not** study according to the ECTS credit system (see <u>7 Glossary important terms for studying Medical Engineering</u>), the transcript must include at least semester 5 for 3-year study programs and semester 7 for 4-year study programs. If your Bachelor's degree follows the ECTS credit system (this applies to many universities in Europe and some non-European countries), you can apply for the Master's degree program once you have acquired at least 140 ECTS points in your Bachelor's.

Foreign certificates must be submitted as certified copies. If the certificates are not available in German, English or French, a certified translation is required (see https://www.fau.eu/study/from-abroad/important-information/notes-on-certification-of-documents/). Certificates from Germany can

be submitted as non-certified copies. However, the original documents must be submitted for enrollment.

Important note!

If you have been admitted to the Medical Engineering degree program and do not begin your studies within the same semester, your admission is valid until the Master's admission process for Medical Engineering changes significantly. However, you **must reapply** (see notes on the Medical Engineering website) within the application deadlines for the semester in which you would like to start your studies. Please upload you old admission letter!

2.2.3 Qualification Assessment Process (QFV)

During the qualification assessment process (QFV), it is determined if applicants possess the required qualifications for the Master's degree program Medical Engineering at FAU. Unlike studies with a *numerus clausus* system (NC), there is no limitation to the numbers of students accepted. **All suitable applicants are admitted.**

The QFV process is divided into several steps:

- First, all applications received by the Master's office of FAU are examined with regard to their completeness and formal requirements. Foreign grades are converted into the German grading system.
- After that, a content-oriented evaluation of the application documents is conducted. The
 documents are pre-selected according to the verified mathematical skills. If the knowledge in
 mathematics is not sufficient, first rejection letters are sent out via the Campo portal.
- The documents of the remaining applicants are further examined based on their qualifications in Mathematics, Computer Science and Electrical Engineering. If those qualifications are equivalent to those of the Bachelor's degree program Medical Engineeringat the FAU and if you have received a final Bachelor's grade of at least 2.5 (according to the German system), first direct admissions are given.
- The remaining applications (not equivalent but similar qualifications earned in the Bachelor's studies and/or Bachelor's grade worse than 2.5) are redirected to the departments of Computer Science, Electrical Engineering and Mechanical Engineering/Material Sciences in concordance with your selected branch of study.
- The application documents are reviewed at the departments by professors who are members
 of the Admissions Committee Medical Engineering and invite prospective candidates to an



admission exam in person or via zoom.

- The oral exam will take about 15 minutes and will test the following categories:
 - o Discipline-related basic knowledge: e.g. in Mathematics, Physics and Algorithmics
 - o Profound knowledge of the chosen branch of specialization (Medical Image and Data Processing, Health and Medical Data Analytics, Medical Electronics or Medical Device Engineering, Pro-duction Technology and Prosthetics or Medical Robotics)
 - o Description of a relevant discipline-related project (e.g. Bachelor's thesis), knowledge of the relevant literature
 - Analysis of the grade curve from previous studies

For applicants of Medical Image and Data Processing or Health and Medical Data Analytics, the test will be held in English, for all other branches of study, in German. The examination shall be rated as "bestanden" (passed) or "nicht bestanden" (failed).

2.3 During your Studies

2.3.1 Conditions and Compulsory Modules

Applicants from other universities and programs usually receive so-called "conditions" with their Master's admission. The aim of these conditional subjects is that you catch up on certain qualifications which were already acquired by the Bachelor's students of Medical Engineering at FAU. The conditional subjects are usually one or both of the following lectures:

- Advanced C++ Programming (online course at Virtual University Bavaria VHB)
- **Engineering Mathematics**

More information on these subjects can be found in the online database UnivIS (see <u>5.3 UnivIS</u>). The conditions must be met within one year (i.e. from October 1st until September 30th of the subsequent year or from April 1st until March 31st of the subsequent year), otherwise you will be de-registered. In total you have at most two chances of passing these exams. Even if you have missed the exams for your conditional subjects due to health issues, we cannot prolong the deadline and no further exam attempt is given. The conditions entail an additional workload of up to 20 ECTS credits to the total of 120 ECTS credits of the Master's degree program. However, students can only

use a maximum of 5 credits from their conditional subjects for the module "Free Choice Uni" if they wish to (only recommended if you have very good grades). Once you have passed your conditional subjects, please contact Mrs. Jahreis at the Examinations Office (see <u>8 Useful addresses and contact persons</u>) and inform her. She will pass the information on to the Student Records Office in order for you to be able to re-register for the third Master's semester (see <u>3.4 Re-registration</u>).

As indicated in the footnotes in the Master's module catalogs, some compulsory electives must also be completed in addition to the conditional subjects if certain qualifications have not been acquired in the Bachelor's studies. This applies to the lecture "Fundamentals in Anatomy and Physiology for Engineers" and for the following lectures:

- Branch of study "Medical Image and Data Processing" and "Health and Medical Data Analytics": Pattern Recognition, Pattern Analysis
- Branch of study "Medical Robotics": Robotics 1

Your freedom of selecting modules from your catalog is limited by these compulsory modules - if you are lacking certain qualifications. These compulsory modules are, however, not conditions (i.e. they don't have a one year-deadline). You have time until the beginning of your Master's thesis to pass these courses and they are also included in the total workload of the 120 ECTS credits of your Master's course. If you believe that you already possess the respective knowledge of the compulsory modules and can prove this with a module description from your Bachelor's program, you are welcome to contact your study advisor and file a petition for accreditation - please visit our website for further details. Your module description will be checked by the responsible lecturer of the FAU module, who will decide whether accreditation is possible. If they give their permission, you are free to skip the respective compulsory module and choose other modules of the same module group instead. Please note, however, that your credits and grade from your Bachelor's module cannot be accounted for your Master's studies, as you are legally required to build up new competencies in your Master's studies in comparison to your Bachelor's studies.

2.3.2 Branches of Study

In the Master's degree program, you can choose between four branches of study: Medical Image and Data Processing (focus on Computer Science), Medical Electronics (focus on Electrical Engineering), Medical Device Engineering, Production Technology and Prosthetics (focus on Mechanical Engineering/Material Sciences) and Health and Medical Data Analytics & entrepreneurship/HMDA (focus on Computer Science and Innovation/Entrepreneurship). "Medical

Image and Data Processing" and "Health and Medical Data Analytics" are international branches of study offered entirely in English. Of course, students of these branches can choose to visit lectures in English as well as in German if they are fluent in both languages.

You must indicate your desired branch of study in your Master's application, but you only make your decision final by taking the exams of a certain branch in the first semester. For international students without the required German language skills it is not possible to switch branches to "Medical Electronics" and "Medical Device Engineering, Production Technology and Prosthetics" since they are taught in German.

2.3.3 Course of Study

The Master's degree program Medical Engineering is composed of nine module groups. Modules M1 (Medical Specialization Modules), M4 (Advanced Seminar Medical Engineering), M6 (Medical Engineering Practical Modules), M7 (Flexible Budget for Faculty of Engineering), M8 (Free Choice Uni) and M9 (Master's Thesis) apply equally to all Master's students. Modules M2, M3 and M5 vary according to the chosen branch of study. All module catalogs for the Master's degree program are updated every semester and published on the Medical Engineering homepage (https://www.medical-engineering.study.fau.eu/current-students/general-study-information-masters-program/)

	Modulgruppe			
Nr.	Name	ECTS		
M1	Medizinische Vertiefungs- module/Medical specialisation modules gemäß § 44a Abs. 1	10		
M2	Ingenieurwissenschaftliche Kern- module/Engineering core modules gemäß § 44a Abs. 2	20		
М3	Medizintechnische Kernmod- ule/Medical Engineering core modules gemäß § 44a Abs. 3	20		
M4	Hauptseminar Medizintech- nik/Advanced Seminar Medical Engineering gemäß § 44a Abs. 4	5		
M5	Medizintechnische Vertiefungs- module/Medical Engineering spe- cialisation modules gemäß § 44a Abs. 5	10		
M6	Medizintechnische Praxis-module/ Medical Engineering practical modules gemäß § 44a Abs. 6	10		
M7	Flexibles Budget Technische Fakultät/Flexible budget Faculty of Engineering und FB WiSo gemäß § 43 Abs. 4	10		
M8	Freie Wahl Uni/Free choice Uni	5		
M9	Masterarbeit/Master's thesis	30		
Summe ECTS-Punkte 120				

Figure 3: Master's study plan template



There are very few mandatory courses in the Master's program. You will mainly choose modules within the offer for a certain module group according to your own interests. This freedom in selecting courses also means that there is no pre-determined course of study and you must compose your schedule on your own every semester.

Even if the Master's study plan template and the module catalogs give you a recommendation as to when you can take your classes, you are not bound to comply. It is possible, however, that the responsible lecturer states certain previous qualifications required for successfully completing the course in the module description in UnivIS. Please consider these notes in your selection. In general, you must inform yourself very carefully, which lecture is offered when (winter or summersemester or both), which requirements are given for participating and if/when you have to register for a course (see <u>UnivIS</u> or in doubt contact the lecturer in question). It is also important to keep theworkload (ECTS credits) required for the module group in mind while designing your schedule.

2.3.4 Description of Individual Module Groups

2.3.4.1 Modules of the Core Curriculum (identical for all branches of study)

Medical Specialization Modules (M1)

This module group is mainly offered by lecturers of the Faculty of Medicine and contains lectures on the subjects of disease diagnosis and the application of technical devices in the clinical field. Students who have not gained medicinal knowledge in their Bachelor's studies are obliged to take the lecture "Fundamentals in Anatomy and Physiology for Engineers".

Advanced Seminar Medical Engineering (M4)

For the seminar module, students can choose between different options from the seminar catalog. You can either attend one seminar with a workload of 5 ECTS or two different seminars worth 2.5 ECTS each. In the seminar, you will give a presentation and write a report on a special topic, which can either be assigned to you by your lecturer or chosen by yourself from a list of potential topics.

Medical Engineering Practical Skills (M6)

This module is composed of two non-graded practical achievements, which are both carried out at the university. Please do not confuse these practical modules with business internships. There is no business internship included in our Master's curriculum.



Academic Laboratory (M6.1)

Academic Laboratory refers to a laboratory training in which students learn how to prepare, execute and document experiments at the university. Academic laboratory tasks at the Department of Computer Science, for example, include the resolution of a given problem with a hardware or software-based method and the analysis of the solution incorporating a database. The preparation for the laboratory training is conducted according to the course instructions and generally includes literature or exercises connected to the experiment. Your work must be documented in a laboratory journal. This documentation must contain the applied materials and methods, the results, and an analysis and discussion of the lab work.

Many courses offered by the Faculty of Engineering and the Faculty of Sciences that are marked as "Praktikum" (practical training) in UnivIS fulfil the requirements for Academic Laboratory. It is also possible to divide the Academic Laboratory into two laboratory trainings with a workload of 2.5ECTS credits each.

You can search specifically for laboratory trainings in UnivIS by selecting "Lecture list" for the search, clicking on "expert search" and searching for "Praktikum" as the type of class. If you select English as your language ("Sprache"), you will receive a list of trainings with English language supervision. You can also find a list of suitable and not suitable courses for the Academic Laboratory module on our study program website. If you are not sure if the training you have selected is suitable for the module, please contact your study advisor.

Research Laboratory (M6.2)

The Research Laboratory allows students to learn how to apply academic methods in the field of research and serves as a good preparation for the Master's thesis. The focus of the research work can be of experimental, theoretical or constructive nature or a combination of these areas. The Research Laboratory is usually conducted at a department of the Faculty of Engineering. Research Laboratories at the Faculties of Medicine or Science are also possible after being green-lighted by your study advisor. The Research Laboratory can also be conducted at a company if your academic supervisor at FAU agrees. In order to do so, students must inquire about industry contacts at the respective FAU chair. Do not sign a contract for an internship at a company on your own, since these projects usually cannot be supervised!

It is obligatory that your FAU supervisor issues a certificate regarding the completion of your research laboratory to hand in at the Examinations Office. The form can be found on our home-page in the <u>Research Laboratory section</u>.



The aim of the Research Laboratory is to familiarize the students with tasks in engineering-related research and to offer practical experience in scientific work on Master's level. That includes learning how to research literature and assess its relevance, develop and apply criteria for the evaluation of the research work, and further develop the methods applied.

A written report of the conducted work must be submitted. You can either participate in a scientific publication of your supervising chair as a co-author or can present an individual report (4 to 6 pages) to your supervisor which follows the style of scientific publications (abstract, introduction, methods, results, discussion, and references).

Flexible Budget Faculty of Engineering (M7)

For this module, you are allowed to take any **graded** course offered on **Master**'s level at the **Faculty of Engineering**. This means that the course must be assigned to at least one Master's program in UnivIS. Please note that your conditional subjects do not fall into this category, as they are Bachelor's courses. If you are planning to go abroad for an exchange semester, this module is a good opportunity to incorporate academic achievements that would not be accredited otherwise (see 3.17 Accreditation of academic achievements).

Free Choice Uni (M8)

For this module, you are allowed to take any course offered at our university (e.g. language courses, psychology, economics, technical or medical engineering courses you have not used elsewhere) as well as on-site exams (or online exams with identity control) offered by the Virtual University of Bavaria (see 5.7 Virtual University of Bavaria (VHB)) with a total workload of 5 ECTS credit points. The only condition is that the class must be **graded**. If the total amount of workload exceeds 5 ECTS credits, you can still use these classes for the "Free Choice Uni" module; however, you cannot split up modules and use them partly for another module group. If you are planning to go abroad for a semester, this module is a good opportunity to incorporate academic achievements that would not be accredited otherwise (see 3.17 Accreditation of academic achievements). M8 can also be used for up to 5 credits of the workload acquired in your conditional subjects. In this case, you should be satisfied with the grades you have received in your conditional subject, otherwise you will lose the opportunity to improve your overall grade with a different course.



Master's Thesis (M9)

Once you have achieved 75 ECTS credits and completed your conditional subjects (see 2.2.1 Admission requirements) and your compulsory electives (see 2.3.1 Conditions and Compulsory Modules), you can begin your Master's thesis. The thesis paper consists of a workload of 27.5 ECTS credits and therefore weighs more on your final grade than a Bachelor's thesis. Additionally, you will will give a presentation about your thesis results worth 2,5 ECTS credits. You should begin contemplating a Master's thesis topic in your last semester at the latest, preferably earlier, so you can choose your lectures specifically to acquire the appropriate knowledge for your thesis project. The Master's thesis topic is given to you by a professor of the Faculty of Engineering who is involved in the engineering core curriculum and engineering specializations of the Medical Bachelor's Master's Engineering or degree program (see: https://www.medicalengineering.study.fau.eu/infocenter/persons-of-interest-and-departments/). The professor signs the registration form for your thesis paper and is responsible for its grading. You can select a topic by searching the websites of the different chairs or checking the bulletin boards in the Faculty of Engineering. You also have the possibility to approach professors and PhD students at a chair on your own and ask if you can work on a medical engineering subject there. Only professors and junior professors can officially supervise your Master's thesis.

The technical and practical supervision is usually conducted by an academic employee or a doctoral candidate of the same chair. This task can also be performed by a supervisor from a company if the department's responsible supervisor agrees that your paper is conducted within a business cooperation. If you are interested in this option, you must ask at your chair of choice if there are established business contacts and partners appropriate for your paper. You cannot establish a business contact for your Master's thesis on your own since external projects cannot be supervised!

You aslo need a medical supervisor, who will not grade your paper but proofread your work regarding its medical content. This medical supervisor may be an employee of the University Hospital or a similar institution, e.g. another clinic, an x-ray center or the Faculty of Medicine (the supervising departments often have established contacts) or even a general practitioner. Before you start the thesis process, you should ask your medical supervisor to which degree they want to be involved in supervising your thesis paper. For instance, do they want regular updates from you during the process or do they prefer to proofread your final draft? The chair at which you carry out your Master's thesis usually already has established contacts with a medical supervisor.



You must register your thesis at the Examinations Office through your supervising chair. The form required must be signed by the supervising professor, the medical and, if applicable, the technical supervisor and can be found on the <u>Medical Engineering homepage</u>.

From the date of registration, you have **six months** to complete your thesis paper. An extension of up to three months can be given if severe issues occur. If you become ill during the working or writing process and submit a doctor's notice to the Examinations Office, your working period is on hold for the amount of time indicated in the notice.

The Master's thesis must include a short summary of the results (abstract) and a declaration by the student confirming that the thesis is an original work and that no other sources or materials than the ones listed were used. The design must meet the regulations given by the supervising chair – please ask there for style guidelines. Within the first two weeks after your registration, you have the possibility to resign from your Master's thesis and switch your topic once. For this process, you must hand in a substantiated request at the Examinations Office. Once your thesis paper is completed, one digital copy (PDF document on a storage device) of the Master's thesis must be submitted to the academic supervisor. They can also require you to additionally submit a printed and bound version of your thesis – please check with them in due time whether the printed version is necessary or not. If the Master's thesis receives the grade "unsatisfactory", students have the options of either revising their paper or choosing a new topic once in the subsequent semester.

2.3.4.2 Modules Specific to your Specialization

The module groups M 2 (Engineering Core Modules), M 3 (Medical Engineering Core Modules) and M 5 (Medical Engineering Specialization Modules) include the courses that are specific for the specialization you have chosen. They are listed in the corresponding catalog of your branch of study, which can be found on the Medical Engineering homepage and is updated each semester. In the catalog, it is crucial to pay attention to superscripts and footnotes. You can incorporate the courses specific to your specialization flexibly. For M 3 you can incorporate up to 5 ECTS credits from M 2 and M 5 of your own branch of study or from M 2, M 3 or M 5 of the other (mostly Germantaught) branches. For M 5 you can incorporate up to 5 ECTS points from modules M 2 and M 3 of your branch of study orfrom M 2, M 3 and M 5 from the other (mostly Germantaught) branches.



2.4 After Completing your Studies

2.4.1 Certificates

After successfully completing your last academic achievement in the Master's degree program, you will receive your Master's certificate, transcript of records in German and English, diploma supplement and a grade distribution table within four weeks by mail. Please indicate a working postal address!

Master's certificate: It shows all modules that are part of your master's examination with respective grade (if available) and ECTS credit points. The certificate will also show your overall grade and the topic of your Master's thesis paper. However, it will not show failed attempts or the number of semesters you studied.

Transcript of records in German and English: It shows every module you have taken, its respective grade (if available) and ECTS credit points. Passed modules which were not considered in your Master's examination, are included here. They will be listed under the category "Additional modules". <u>Again, the transcript does not contain information about failed attempts or the number of semesters that you needed to graduate.</u>

Diploma supplement in German and English: It shows general information regarding the content of the study program, the qualification profile of the graduate and the German university system.

Grade distribution table: To simplify the comparison of final grades achieved at different universities in different countries, Friedrich-Alexander-Universität Erlangen-Nürnberg publishes grade distribution data in addition to students' final grades. For each grade in the local grading system, the number of degrees awarded with this grade in the reference group is given.

If you intend to apply for jobs right after handing in your Master's thesis paper, you can ask the supervisor of your thesis paper for a confirmation that you will receive at least a 4.0 ("passed") for your thesis. After submitting this confirmation to Mrs. Jahreis of the Examination's Office, you will receive a preliminary certification of your graduation.

2.4.2 Doctorate

If the research you have done for your Master's thesis inspired you to immerse yourself further into the topic, you should think about writing a doctoral thesis. You first need to find a supervisor for your

thesis. You can inform yourself online at the chair of your choice or directly contact your professor. Information on all formalities can be found here: https://www.fau.eu/graduate-centre/. The FAU Graduate School offers registered doctoral candidates courses in scientific work, literature administration or statistics, among other things.



2.5 Useful Tips

2.5.1 Tips for Successful Master's Studies

Tip n°1: Visit the Master's Welcome Event

The study advisory for Medical Engineering organizes an introductory event for first semester students at the beginning of the lecture period every winter and summer semester. You will be introduced to the campus of the Faculty of Engineering (your primary study location) and receive helpful information regarding your studies and social life as a student. The welcome meeting is also a chance to meet and bond with your fellow students, which will be essential in the upcoming semesters. The dates for the welcome event are published on the Medical Engineering homepage.

Tip n°2: Visit the Medical Engineering Homepage.

The homepage of the study program http://www.medical-engineering.study.fau.eu/ includes the categories "prospective students" and "current students". Many questions can be solved by reading through those pages. Please also give the FAQ section a thorough read!

Tip n°3: Get Familiar with the Campus and the City Center of Erlangen.

The courses for Medical Engineering mainly take place on the campus of the Faculty of Engineering (in the southern part of Erlangen) and partly in the city center. Knowing your way around and having a bike is an enormous advantage while getting from one course to another (please get familiar with German traffic rules!). It is also recommended to stroll around the campus and the lecture halls as they are not sequentially numbered (see <u>9 Map</u>). Sooner or later you will need to know where to find an ATM or the CIP-Pool supervisor (see <u>5.2 CIP-Pool-Account</u>). The student association FSI MedTech (<u>7 Glossary - important terms forstudying Medical Engineering</u>) regularly offer guided tours through the campus at the beginning of the lecture period.

Tip n°4: Get Familiar with the FAU Information System UnivIS.

Whether you are looking for the email address of a professor or need to know how to register for a course, UnivIS (see <u>5.3 UnivIS</u>) will become one of your most important tools while studying. Take some time at the beginning and get to know the search functions! A very helpful one is the expert search of the category "lecture list". There, you can search for different types of classes (e.g. "Praktikum"/tutorial) or the course language ("Sprache"). Unfortunately, UnivIS is only in parts available in English. Don't hesitate to ask fellow German students for help and try to learn the German terms as fast as possible to be able to work with the German version.



Tip n°5: Don't Miss the First Meetings of the Semester!

In most lectures, the professor discusses the most important issues during the first session, e.g. where to find the study material, how you can register for the tutorials, etc. Please check if there is a set date for your laboratory training or seminar on UnivIS for registration or a preliminary discussion. If so, it is mandatory to respect these dates!

Tip n°6: Collect Information.

A unique trait of the German university system is that students must organize their studies on their own, from the class schedule to the study material, even the topic of your Master's thesis. If you are unsure about an issue, you should always search for the answer independently. For example, if the lecture content seems unclear, it is helpful to research the topic by looking for literature in the library or forming a study group. For general study-related guestions, you can take a look at the FAU website. Navigating through the website is sometimes a bit complicated, but you will have high chances for good results if you enter your key word and "FAU" in the search engine. If you have subject-specific or legal questions, we recommend looking into examination regulations Medical Engineering (FPO MT) or the general examination regulations of the Faculty of Engineering (ABMPO TF) (links for both documents can be found on the Medical Engineering homepage). If all those methods show no results, don't hesitate to ask someone for help, like the student association or the study advisory. The best approach to avoid misunderstandings is to clear up any doubts as soon as possible, or else you might discover at the end of the semester that you are taking the wrong course. This sort of organization is the student's responsibility. You can also contact your professors regarding important issues (but refrain from asking them questions the answers of which can be found by a click on UnivIS). On occasion, you will need a little patience while waiting for your professor's answer. If professors do not reply to your emails, you can visit them during their consultation hours. You can find their schedule either at the chair's homepage or by asking the chair's secretary.

Tip n°7: Focus on your Conditional Subjects.

If your admission requires you passing conditional subjects, then you should mainly focus on passing them. You must pass a conditional subject within a year in order to continue your Master's studies. If you are struggling with the first semester engineering classes from the Master's module catalog because you are lacking basic knowledge of the conditional subjects, you can attend



lectures from module M 1, M 7 and M 8 instead.

Tip n°8: Read Module Catalogs and UnivIS Thoroughly.

Study the module catalogs carefully and pay attention as to which subject is offered in either winter or summer semester or in both when designing your personal class schedule. **Read the footnotes!** Although the module catalogs are compiled with special care and are updated regularly, it is possible that some information is incorrect. This can occur when e.g. an external department (e.g. at the Faculty of Medicine) stops offering a certain lecture without informing the Study Commission for Medical Engineering (7 Glossary - important terms for studying Medical Engineering). The lecture in question may still be listed in the module catalog although it is not possible to take it anymore. To avoid any misinformation of this kind, we recommend consulting both the module catalog and the UnivIS entries for the current semester and consult your study advisor if there in doubt.

Tip n°9: Get to Know your Chairs Early.

Inform yourself early about the chairs at which you intend to do your Research Laboratory or Master's thesis paper and get to know potential supervisors. All of the chairs have a website, which you can check from time to time for research topics, events and offered courses. Many of them are also present on social media, making it even easier to follow their activities.



2.5.2 Obstacles in your Master's Studies and how to Deal with them

Conditions

Issue: It is likely that your conditional subject is not offered every semester but only once a year. For example, if you start your Master's studies in the winter semester and have the lecture "Engineering Mathematics" as a conditional subject, you only have the possibility to attend the lecture in the summer semester. However, you must complete your conditional subjects within a year after the start of your studies and therefore have only one chance to pass the exam instead of two.

Solution: You acquire the lecture's content studying the online material on your own and take the repeat exam of your conditional subject offered in the winter semester. Please contact your lecturer to get access to the course material!

Conditions

Issue: If an exam for a conditional subject is scheduled to take place in the second examination period (see <u>3.7 Examination registration, examination period</u>), you might have difficulties reporting back to the Examinations Office that you have passed your conditional subjects within the given time frame of one year.

Solution: In this case, contact Mrs. Jahreis of the Examinations Office as soon as possible. She can support you in emergency cases in requesting a faster correction of your exam.

3.1 Semester Schedule

The winter semester always begins on October 1st and ends on March 31st; the summer semester takes place from April 1st until September 30th. The lecture period, i.e. the term in which lectures are held, is scheduled roughly from mid-October until the beginning of February and from the beginning of April until the end of July, respectively. The actual dates vary from semester to semester and can be found here: www.fau.eu/study/current-students/semester-dates/. The webpage also lists all official holidays (i.e. lecture-free days) in Bavaria and Erlangen.

3.2 Enrollment

The dates for the enrollment in person can be found here: https://www.fau.eu/education/application-and-enrollment/deadlines-and-documents-for-enrolment/. Your enrollment consists of the following steps:

- You are already registered at <u>www.campo.fau.de</u> Please generate a request for enrollment through the portal. The procedure and necessary documents for enrollment are also explained there.
- Transfer the semester fee as soon as possible. You will find the exact amount of the fee
 and the bank account information in Campo.

After your enrollment, you will receive the activation code for your University user account by mail (see <u>5.1 IdM-Portal</u>). After registering at the IdM portal, you have the possibility to print your certificate of enrollment and **must upload a photo for your student ID card**. If you already reside in Germany, the ID will be sent to you within about four weeks. **Please make sure to add your address where you will be living during the semester in the IdM portal.** If you still live abroad at the time of uploading your photo, your student ID will be generated but not sent to your home country. It will be kept by our Card Service until you enter Germany and come to pick it up. Please contact card@fau.de for more information.

By paying the semester fee, you automatically receive the basic ticket for the local transportation network (*VGN*), which you can print out in the *VGN* online shop (https://shop.vgn.de/index.php/product/518/show). The ticket is valid for the entire *VGN* network from

Monday to Friday between 7 p.m. and 6 a.m. and all day on Saturdays, Sundays and public holidays. If you want to use public transportation between 6 a.m. and 7 p.m. during the week, you can purchase the "Zusatzticket" (ad-on ticket). More information can be found here: www.fau.eu/study/programme-start/semester-ticket/.

3.3 Housing

Once you have received your admission for the Medical Engineering degree program, please look for accommodation as early as possible! You can find more information here:

www.fau.eu/international/international-applicants/important-information/accommodation-2/ http://www.werkswelt.de/index.php?id=tipps-fuer-erstsemester&setlang=en

Everything else (books, notebook, etc.) is not as crucial and can be easily organized in the first few months of the lecture period. The housing situation in Erlangen is especially tense at the beginning of the winter semester. You should also consider moving to nearby cities (Nürnberg, Forchheim, Fürth) and surrounding villages, as they are all safe, offer a good quality of living and are well-connected to Erlangen via public transportation. Even for these cities, you should start looking as soon as possible!

3.4 Re-registration

On the webpages of the Student Records Office you can find information on the re-registration process: https://www.fau.eu/study/current-students/semester-dates

If you want to continue your studies at FAU, you must re-register for every following semester mid-way through your current semester. All students receive an email by the Student Records Office to their FAU email address as a reminder to re-register on time (please make sure that you check the emails to your FAU address or relay it in the IdM portal!). The re-registration consists of transferring the semester fee to the university's bank account. You can find the bank details and more information in Mein Campus(see <u>5.6 MeinCampus</u>) in the tab "Studentenkanzlei aktuell". Please make sure to enter your full name and student number in the bank transaction. If you fail to do so, your transaction cannot be allocated to your student account and you will get de-registered.

3.5 BAföG

The Federal Training Assistance Act (BAföG) gives a monthly financial aid to students whose family

cannot support them. The financial aid consists of an interest-free loan, which must only be re-paid in parts after the completion of your studies. The requirements for receiving *BAföG* are the following:

- You must be a German citizen or have permanent residence permit for Germany.
- You must regularly prove by your academic achievements that you are on the way of successfully completing your studies. You must have started your Bachelor's degree program by the age of 30 and your Master's degree program by the age of 35. Your BAföG application must be sent to the BAföG office (see <u>8 Useful addresses and contact persons</u>).
 You can find more information here: http://www.bafög.de/ (in German)

Your *BAföG* certificates to prove your academic achievements can be printed out over *MeinCampus* (see <u>5.6 *MeinCampus*</u>). If that is not possible because you have not earned enough ECTS credits, please contact your study advisory.

3.6 Courses - a Typology

As a Medical Engineering student, you will attend a variety of course types, here we give you a quick overview:

Most courses are **lectures** that take place one to three times a week and in which the lecturer presents their subject topics to the students. Lectures usually take place in big lecture halls, with many students attending and are of a more theoretical nature. Students generally play the role of a passive listener, who, depending on the teaching style, might have to answer some questions. It is highly recommended to bring the study material or lecture slides provided online into the lecture and take notes.

Exercises are often offered as an addition to lectures to explain the lecture content in greater detail or to show how it is applied. There are blackboard exercises and computer exercises.

During the **blackboard exercises**, the content of the lecture is repeated and discussed using tutorial exercises. The groups are significantly smaller than in the lecture, so it is not a problem to ask questions or re-address a subject. It is smart to go over the exercises before the tutorial and to write down possible questions, so you can follow the explanations of the tutor and profit from extensive answers. The registration process for the exercise is explained by the lecturer during the first lecture session.

The **computer exercises** are designed to apply the theory taught in a computer science lecture and write your own programs. No classic teaching takes place, but tutors are present and can answer

your questions while you are programming independently. Usually, there is no registration required for the computer exercises. You can drop by at the dates indicated and work on your projects. Your exercise supervisor will tell you if you must solve the exercises on your own or if under certain conditions you can do the exercises in groups of two. The results are mostly submitted online and corrected every one to two weeks. The exercises are usually very time consuming, so do not wait until right before the deadline to attend the computer exercise and ask questions. The computer exercises just before the deadline are usually very crowded.

Exercises can be graded or ungraded and you might receive ECTS credit points for them or not. They are partly mandatory in order to pass a certain module, partly thought to be a voluntary addition to your lectures. In some cases, the successful completion of the exercises will give you bonus points for the exam. Sometimes, questions about the exercises are included in the lecture exam. (please consult UnivIS and/or with your lecturer).

Tutorials are very similar to exercises except that they are usually not mandatory and you cannot earn credits for them. They are meant for the independent solving of exercises with one or more tutors present to address questions to.

For **Laboratory Trainings** you usually receive documents before your first appointment (possibly at the first meeting or via online platform (see <u>5.4 StudOn</u>). An experiment consists of a preparation that must be done at home and brought to the training, and the experiment itself that is conducted at the university. It is important to give your best on the preparation as it will be tested by the supervisors and will help you to understand and conduct your experiment more easily and faster. There is always compulsory attendance in laboratory training, i.e. you must be present at all sessions. If you have missed up to 15% of your training due to illness and have a doctor's certificate confirming this, then your training supervisor must offer you a substitute achievement with which you can compensate your absence. If you miss more than 15% of the training, you must repeat it completely.

Seminars are usually composed of a smaller group discussing a special topic with the lecturer. It is important to actively participate in the discussion. Every student handles an individual subtopic and must give a presentation during the seminar as well as write a paper about it. You can choose your own project or select one from a list. The first few seminar sessions are normally introductory meetings in which the professor teaches the most important basic knowledge. Attendance during these sessions

voluntary most of the time. As soon as the presentation phase starts, attendance is compulsory for all seminar participants. After a student has held a presentation, the subject is discussed in the group and questions can be asked.

In most courses (lectures) of the Medical Engineering program, attendance is not mandatory.

You will note this by the lack of attendance lists, you are therefore not obligated to be in the lecture hall or course room but can work through the material at home, as it is provided by the professor on StudOn or the FAU video portal (see <u>5.9 Video platforms</u>). We do, however, recommend attending the on-site classes, as you get to know your lectures better and your questions can be answered immediately.

In classes at the Faculties of Medicine, Humanities and Business and Economics, which you might take for module group M1 or the "Free Choice Uni" module (M8), attendance regulations may differ. Your lecturer will inform you on this matter during the first session.

3.7 Examination Registration, Examination Period

The registration for the exams has to be done via the *Mein Campus* portal (see <u>5.6 Mein Campus</u>) about five weeks after the beginning of the lecture period. The exact time period of the examination registration (three weeks in total) will be communicated at the beginning of the semester by your tutors and professors. Additionally, you will be notified via email by your study advisor when the registration period starts.

The fact that you are attending a course and perhaps have to register for it, does not mean that you have to take the corresponding exam or are automatically registered for it. If you do not register for an examination during the official registration period, you cannot take the exam at the end of the semester.

Should any technical problem occur during registration (e.g. error report), please contact the *Mein-Campus* support (see <u>8 Useful addresses and contact persons</u>). Should any examinations from the Medical Engineering curriculum be missing, please inform your study advisor, who will take care of it.

If there are different ECTS credit points offered for the same exam, you must achieve at least the value given by your module catalog. You may achieve more ECTS credits voluntarily and incorporate them additionally into the same Master's module group, allowing your exam grade to be incorporated at a higher ECTS value into your module group. You must decide on which type of

exam you want to take until the exam registration period. Exams for the module "Flexible Budget Faculty of Engineering" (M7) and "Free Choice Uni" (M8) are normally not listed in your *Mein Campus* account. If this case the registration can be made by Mrs. Jahreis of the Examinations Office. A short email with your Student-ID Number, your name and the respective examination number from *Mein Campus* is enough. The professor of your elective class should, of course, be consulted whether it is possible for you to take the exam as a non-discipline-related participant. In this case, you will often receive the examination results either as a pdf certificate, which you have to submit to the Examinations Office, or your professor will send the results directly to Mrs. Jahreis.

The examinations take place in the lecture free period (semester break). The **first examination period takes place in the first two weeks after the end of the lecture period** and the **second period in the last three weeks of the semester break** (i.e. partially during the official start of the new semester). The exams during the second exam period are still regarded as part of the semester in which its registration took place. You can find the scheduled exam periods for the Faculty of Engineering here. The exact time and room of an exam is published in *Mein Campus* around two weeks before the exam date.

3.8 Exam Preparation

In order to prepare for the exams, it is recommended to regularly attend the exercises and tutorials during the semester, where the lecture content is explained in detail and you can ask questions. Once the exam dates are slowly approaching, it makes sense to start preparation early on. You should schedule a couple of weeks for studying as well as determining certain hours in which you will be studying in order to minimize the time pressure. And do not forget to take breaks regularly! Six hours of pure studying (over the course of a day) are considered psychologically ideal, everything exceeding this time span is inefficient. Do not solely study the lecture content. Contact the Student Association Medical Engineering (FSI MedTech) or, depending on your subject, the Student Associations Computer Science or Electrical, Electronic and Communication Engineering (see 8 Useful addresses an- contact persons) and ask them for old exams in order to practice on previous exam questions. Often the lecture content becomes clearer once you try to solve actual exercises. You should start out trying to solve the exercise on your own without consulting the solution. It is even more helpful if you discuss open questions and results in small study groups of three to four people. Even if you make a lot of mistakes in the beginning: don't beat yourself up over it and ask your fellow students for help!



3.9 Exams

The Master's degree program is considered successfully completed if all modules with a total workload of 120 ECTS credits are passed. The total grade is composed of the individual module grades according to their ECTS credit value. Module group M6 (Research Laboratory and Academic Laboratory) is non-graded, so the academic achievements are not included in the total grade. Therefore, the total grade is determined on the basis of 110 ECTS credit points. However, module group M6 must also be completed. Exams can have the following formats:

Oral Examination (German: "mündliche Prüfung"): conducted by an examiner (lecturer of the subject) and a second attendee, who does not ask questions but protocols the exam. The oral exam usually takes about 30 minutes. Your examiner is generally interested in creating a pleasant and conversational atmosphere and try to steer you back into the right direction if you seem to stumble over a problem. We also encourage you to ask back if you have not understood the question or problem and to admit if you do not know the answers to a certain topic. It is always better to speak (even if you are not completely sure if your answer is correct) rather than sitting there in silence and waiting until the time is up.

Written Exam (German: "Klausur"): depending on the information provided in the module catalogs, a written exam can take 60, 90 or 120 minutes. The exam questions can either be open questions or multiple choice. Before and during the exam, the supervisors will indicate how much time is remaining, and once the time is up, there will be no extension. Therefore, we recommend to take a couple of minutes at the beginning of a test so you can assess the number and difficulties of the individual questions and estimate how much time you will need for answering each question.

Electronic Exam (German: "E-Prüfung"): Some FAU professors conduct exams on computers. In this case the exam usually takes place at a certain date in one of the CIP pools (computer pools). In some cases, you can take the exam from your computer at home (remote exam).

Exercise Achievement (German: "Übungsleistung"): In this case, students must submit exercise tasks on a regular basis (mostly weekly).

Laboratory Achievement: It includes performing practical problem solving and writing an experiment protocol and a laboratory report.

Seminar Achievement: It generally consists of a presentation and a written composition of a predetermined topic.

All of these examination types can appear in the form of a **graded course achievement** (German "benotet") or an **ungraded course achievement** (German: "unebenotet). A graded course achievement is defined through its grading, whereas for ungraded course achievements only the successful completion is evaluated (pass/fail). Ungraded course achievements and can be repeated as often as necessary (unlike graded achievements, for which you have a maximum of three attempts). The ungraded "pass"/"fail" scheme is commonly applied in laboratory trainings and tutorials.

A Portfolio Examination (German: "Portfolioprüfung") is an exam consisting of several parts.

You can look up in UnivIS (see <u>5.3 UnivIS</u>) which achievement or examination type is demanded for which module as well as the duration of the exam (e.g. "Klausur, 90, benotet" means a written exam with a duration of 90 minutes).

For the "Free Choice Uni" (M8) module group the examination regulations depend on the respective faculty from which you have chosen your course. The only two criteria which are important for M8 are that you must receive a **graded** achievement and that you take an **on-site exam (or online exam with identity control)**.

For classes that are only held in the winter semester, there is almost always a repeat exam offered in the summer semester (and vice versa); in UnivIS it is marked with the abbreviation "Wdh." ("Wiederholung" = repetition). But you can also take the repeat exam as your first attempt in most cases.

Once the correction of the exam is completed and the grades are registered, you can see the list of your exam results in *MeinCampus* (see <u>5.6 MeinCampus</u>). Please be patient, sometimes the results are not listed until the beginning of the next exam registration period. Some professors publish the preliminary exam results on StudOn (see <u>5.4 StudOn</u>) or via email. You always have the right to access your corrected exam and ask questions if you are not satisfied with your grade or correction. Your examiner must provide you with an appointment. If your objection to the exam correction is

justified, your grade can be corrected to your advantage. In some classes (especially seminar and electives from different faculties), you will receive your results in form of a separate pdf document, so called "Scheine" (certificates). They must be submitted to Ms. Jahreis of the Examinations Office, so that she can enter the results in *Mein Campus*.

3.10 Attempts of Deception, Plagiarism

It is obvious that using non-permitted devices (notes, books, cell phones, etc.) is prohibited. If you are caught in such an attempt of deception, you will automatically receive a 5.0 as your grade and fail the exam.

The same applies to tutorial exercises, seminar papers or final theses in which content was partly or completely copied from another person. If you must solve a programming exercise and copy code from a fellow student, you will get yourself and the other student in trouble. Both will receive zero points and are not allowed to submit any tutorial exercises for the rest of the semester. If such attempts of deception occur repeatedly, the Examination Office must be informed, and measures will be taken.

3.11 Withdrawal from Examinations

If you have already signed up for an exam, but later on do not feel sufficiently prepared, you can usually withdraw from the exam until the third working day (a working day is considered all days from Monday to Friday, excluding holidays and weekends) before the exam date on *MeinCampus*; no explanation is needed. If your exam would take place on Monday, you can withdraw your registration on *MeinCampus* until midnight on Wednesday. **Do consider these deadlines, as it is a wasted attempt to either take an exam unprepared or not showing up at all.** Classes at other faculties could have different deadlines, research the withdrawal deadlines for an exam on time.

The withdrawal two days before the exam (in our example Thursday) or later usually requires significantly more action from your side. You must report your absence due to health reasons with a doctor's certificate which verifies that you are unable to take the test to Mrs. Jahreis at the Examinations Office (the form called "Krankmeldung" be found here can https://www.fau.eu/study/current-students/examination-matters/examinations-office-faculty-ofengineering/ under the category "Information and forms"). If on the day of the examination you cannot attend an examination for reasons outside your control (e.g. traffic, accident or disruption to public transport), you must report this to the Examination Office immediately.

General Study Information

The certificate for examination inability should ideally be submitted until the day of the exam; if you are sick, make sure e. g. a friend will deliver it. Alternatively, you can send the doctor's certificate to Mrs. Jahreis within one week after the exam date via mail. If the deadline has passed and no certificate has been submitted the exam is considered failed.

If you take part in an exam, the supervisor will ask the participants if they are feeling healthy. Until this moment you have the possibility to leave the room for health reasons, get a doctor's certificate right after and submit it to the Examinations Office. If you want to interrupt your exam due to physical or psychological distress after you have received your exam documents, do so immediately after you have realized the situation, leave the exam and visit a university-appointed doctor. A list of these doctors can be found here: https://www.fau.eu/study/current-students/examination-matters/examinations-office-faculty-of-engineering/

Important!

If you complete the examination as normal, you confirm that you are in good health and are able to sit the examination – you cannot submit an application for special consideration retrospectively (even with medical certificates).

3.12 Repeating Exams

Exams can be repeated if you fail them, but the number of attempts varies. Exams of conditional subjects can at the most be taken twice; every other exam three times. Ungraded achievements such as lab courses and exercises be repeated as often as necessary. For the Master's thesis, you only have a second attempt if you have failed the first one.

If you do not pass an exam, you are automatically registered for the repeat exam in the subsequent semester. This also applies if you take a leave from studies (see 3.16 Leave of absence) or de-register from the degree program. If you do not attend the repeat exam (and do not have a doctor's certificate or any other certificate for examination inability), it is considered as another failed attempt. Stays abroad etc. should therefore be organized in such a way that you are still able to attend the repeat exam. If this is not possible you must inform the Examinations Office beforehand and ask Mrs. Jahreis to deactivate your exam registration for the corresponding semester. If you intend to switch to a different university after failing an exam, you must contact the Examinations Office beforehand to avoid a continuous registration for repeat exams at FAU.

Passed exams cannot be repeated. For modules in the Master's degree program that are not

General Study Information

mandatory you have the option of substituting a repeat exam with an exam for another module of the same module group. Please note that this is not the case for the modules that are marked as mandatory (see footnotes in your catalog). In case you want to switch a repeat exam registration according to these rules, please contact Mrs. Jahreis of the Examinations Office <u>during exam registration period</u> to communicate the desired substitution. The number of failed attempts, however, is transferred to your alternative module, i.e. if you have failed your first module once you only have two remaining attempts for your alternative choice. If the first module is worth more ECTS credits (e.g. 5) and is substituted by two modules with lower ECTS credits (2 x 2.5), then the failed attempt will only be transferred to the module of your choice (out of the two).

Important!

You cannot de-register from repeat exams by yourself. You can only withdraw from them with a doctor's certificate or any other certificate for examination inability. The certificates must always be directed to Mrs. Jahreis at the Examinations Office and never to the professor whose exam is concerned. In the following semester, you will automatically be registered for the same repeat exam again.



3.13 Additional Course Achievements

Once you have achieved the mandatory 120 ECTS credit points for the Master's degree, you will not be de-registered from the university immediately but you stay enrolled until the end of the ongoing semester. You can make use of that time and voluntarily take more exams for the compulsory electives or electives in order to improve your final grade. **Only exception: Exams that were already passed cannot be repeated!**

If you decide to take more exams, please communicate this to Mrs. Jahreis of the Examinations Office so that your Master's certificate will not be issued prematurely. At the end of your studies, you must inform her which achievements should be listed in your Master's certificate. If you don't communicate a preference, the best achievements are selected. In the Transcript of Records all of your achievements can be listed (the ones that were not part of your final grade are listed in the category "Additional modules").

3.14 Calculation of Grades

Mein Campus calculates the current total grade and grades of the module groups (e.g. "Medical specialization modules/M1") with every new entry. The individual modules are incorporated into an average grade according to their ECTS value. The average grade of a module group is incorporated into the Master's exam according to the ECTS value of the group. This grade is not rounded but takes only the first decimal into account.

Should you have acquired more achievements than the ECTS credits required in a certain module group and do not want to automatically have the best-graded modules listed, then you must contact the Examinations Office before your final certificate is issued and communicate which achievements should be incorporated into your final grade. The Master's final grade is also not rounded up but cut after the first decimal.



3.15 Studying Abroad

If you are thinking about going abroad during your studies, please start your planning process early, ideally 12-18 months in advance. For a first consultation for stays abroad within the Erasmus partnerships and the direct exchange program of the Faculty of Engineering (e.g. with Australia, Canada and the USA), you can turn to the Office of Student Information and Advice (StIB: https://www.tf.fau.eu/study-ing/office-for-student-information-and-advice-stib/). A good overview of your options for semesters abroad in general is listed on the homepage of FAU's International Office (www.fau.eu/international/ going-abroad) or on the Medical Engineering webpage under https://www.medical-engineering.study.fau.eu/current-students/study-abroad/.

As the Master's curriculum is very flexible, you are very independent in planning a stay abroad under the condition that you have passed your conditional subjects. In general, the medical subjects offered by foreign universities are well-applicable for accreditation in the module group Medical specialization modules (M1) as well as technical and laboratory trainings are for an accreditation as Academic Laboratory (M6.1 see https://www.medical-engineering.study-information-course-syllabus-fpo-2019/).

Furthermore, the Research Laboratory (M6.2, see <u>p. 2.3.4.1 Modules of the core curriculum (for all branches of study)</u>) is a suitable academic achievement to complete during a stay abroad. In this case, you need a supervisor at one of the chairs at the Faculty of Engineering at FAU. They must issue the form for Research Lab, which you can download from the Medical Engineering homepage. The research project itself will be conducted at the university abroad with local co-tutors. Please ask your FAU supervisor in advance if you can carry out the Research Lab module abroad under their (remote) supervision.

The Flexible Budget Faculty of Engineering/M7 is another good option to incorporate modules from abroad, as the only two criteria for this module group are that they cover technical content on Master's level. Courses about language and culture can always be used for M8/Free Choice Uni.

The offer of partner universities for Medical Engineering is still under development, our recent partner universities can be found here: https://www.medical-engineering.study.fau.eu/current-students/study-abroad/#sprungmarke2. Medical Engineering students can also participate in the Erasmus exchange programs of the departments involved in the study program (Electrical Engineering, Computer Science, Mechanical Engineering, Material Science and Chemical Engineering and Bioengineering, depending on your branch of study). Just consult the corresponding webpages.

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It is also possible to write a thesis paper abroad. In this case you must have a responsible supervisor from one of the FAU departments participating in the Medical Engineering Program, i.e. a professor who agrees to let your write you Bachelor's or Master's thesis paper under external technical supervision. The chairs often already have established contacts abroad, it is worth asking! A request for accreditation will not be necessary, because the FAU supervisor will determine the grade.

In every other case, you should make sure before leaving that your achievements abroad will be accredited for your studies at FAU. Before studying abroad, students and the study advisory commit to a so called "learning agreement", a document which defines which courses from abroad can be accredited for which modules at the FAU. These modules must generally correspond with the contents and learning outcomes at FAU. A good way of determining whether classes are equivalent is to compare the external modules with the ones from FAU and highlight the common content. If 80% of the material is identical, there is a realistic chance of accreditation. Accreditation for electives (Flexible Budget Faculty of Engineering/M7, FreeChoice Uni/M8) can be handled more flexibly. Please ask your study advisor. In the "Study abroad" section of the Medical Engineering website you can download an example sheet, in which you can insert the external module descriptions, (possibly converted) credits and further details. This sheet is to be sent back to your study advisor who will discuss the possible accreditation with the person responsible for the FAU modules.

The more information is provided about the foreign subjects, the higher are your chances of accreditation. Invest some time and effort in researching the information! With short content descriptions that might not even resemble the modules at FAU, you only irritate your professor and do little to improve your chances. Instead, demonstrate that you have read your study offers carefully and make your information available as reader-friendly as possible. It is helpful to contact the professors of your foreign university before leaving Germany and to ask for a detailed content description.

If the responsible lecturer for the module at FAU gives their consent, the accreditation of your foreign achievements will be inserted into the learning agreement, making the accreditation process upon your return easier and quicker. Should changes in your study plan occur during your stay abroad, please contact the study advisory as soon as possible in order to adjust your learning agreement. We generally recommend taking a leave from studies (see next chapter) for your semester abroad.



3.16 Leave from studies ("Leave of absence")

A leave of absence during your studies for important reasons can be requested at the Student Records Office (more information: https://www.fau.eu/study/current-students/student-records-office/). This includes e.g. a semester abroad, maternity and parental leave, a serious health condition or other severe issues. A designated "semester for industry internships" does not exist at FAU. You can, however, request a leave of absence if an industry internship takes up more than seven weeks of the lecture period. For your studies abroad, you can take up to two subsequent semester leaves. For an internship, you can only take one semester. A vacation semester cannot be granted for professional activities, writing a final thesis paper or a family visit abroad.

If you are able to plan your leave of absence early on, please submit your request before re-registering for the next semester but at the latest before the start of the lecture period of the new semester. If the reason for your leave of absence only crystallizes later in the semester, you can appeal on short notice. However, requests that are submitted two months after the beginning of the lecture period cannot be considered. It is also not possible to retroactively convert an already completed semester into a vacation semester.

During a leave of absence, the semester is not counted as an official Master's semester (but as a "zero semester"); you are therefore generally not allowed to render achievements during this semester.

The exceptions to this rule are:

- Repeat exams: You are obligated to repeat exams during your leave of absence if you
 have failed exams in the previous semesters (does not apply if you have asked Mrs.
 Jahreis beforehand to deactivate your repeat exams fort that time period).
- Study abroad: You can take exams during a study mobility phase abroad while you take
 a leave of absence at FAU, and incorporate the academic achievements into your studies
 at FAU after your return.
- If you miss exams in an official study semester at FAU due to your upcoming stay abroad (because the semester at the foreign university starts earlier), you have the possibility of taking those missed exams after your return to FAU, even though it is during the official study leave. For this procedure, you must submit a confirmation of the foreign academic calendar to Mrs. Jahreis.



Important note!

In general, it is not possible to complete academic achievements during your leave of absence. In Bavaria, however, students who take leave of absence due to raising children have the possibility to still take exams during that time.

3.17 Accreditation of Academic Achievements

If you have completed achievements at a different university in Germany or abroad, in a different degree program, during a vocational training or professional activities, which are equivalent to those of the Medical Engineering degree program, it is generally possible to accredit those achievements for your studies. You can find out whether a Medical Engineering module is comparable to your external achievement by looking through its module description in the corresponding module handbook on the Medical Engineering homepage or UnivIS (see <u>5.3 UnivIS</u>).

We recommend comparing the content description of your external achievement with the FAU Medical Engineering module and highlighting the identical elements. If 80% of the material is identical, there is a realistic chance of accreditation. It is always possible to accredit your achievements for the Free Choice Uni/M8 module under the condition that your achievement was graded and that it was not part of your Bachelor's degree. In this last case, you do not have to search for an equivalent module at FAU.

To start the accreditation process, you must fill out the accreditation form that you can find online: https://www.medical-engineering.study.fau.eu/current-students/recognition-of-academic-achievements/

In the column "Mein campus module no." you must insert the corresponding exam number from Mein Campus. Please also add the module (group) number (M1, M7, etc.) from the Master's module catalog. Submit the signed form at the study advisory, in addition to the following documents:

- Certificate/transcript of records and an extensive module description (in German or English, please translate if necessary) or, if nonexistent, scripts, notes, old exams, literature references, etc. Only exception: If the accreditation has been determined in a learning agreement before (see 3.15 Studying abroad), you don't have to submit the aforementioned documents.
- Information on the common semester workload and the grading system of the foreign university;

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i.e. the number of credit points (if not ECTS credits) that should be achieved during one semester and the best and worst passing grade according to the foreign grading system.

Your accreditation representative then discusses the possible accreditation with the person responsible for the FAU modules. If the lecturers give their consent, the results will be transferred to the Examinations Office and listed in *Mein Campus*, where foreign grades and non-ECTS credits are transferred into the German system. By accrediting a subject from abroad for a certain Medical Engineering class, you will receive as many ECTS credits as the corresponding module indicated in the Medical Engineering study plan. If accrediting for the module "Flexible Budget", the credits will be transferred exactly into the ECTS system. Transferred foreign grades do not necessarily correspond with the German grading levels, so e.g. 2.1 will be accredited as 2.1 and not be rounded to 2.0 or 2.3.

If your request for accreditation of academic achievement is denied by the responsible lecturer, you have the right to object the decision at the Examinations Office and your case will be re-evaluated.

You can issue your request for accreditation during the entire time of your studies; your achievements will stay valid, no matter when they were completed. You also have the possibility to accredit un used achievements from a previous or interrupted degree or a stay abroad during your Bachelor's to the Free Choice Uni module if the content- and quality-related requirements for accreditation are fulfilled.

Accrediting an achievement in your Master's that has already been accredited in your Bachelor's degree, however, is generally not possible.

Important note!

If the accreditated courses sum up to a value of 30 ECTS credits or higher, you are automatically upgraded to the next higher semester.

The accreditation of non-academic achievements (e.g. from vocational training) may not exceed half of the ECTS credit values of your degree program, i.e. 90 ECTS credits in your Bachelor's and 60ECTS Credits in your Master's.



3.18 Extending Your Studies

In case you cannot finish your Master's studies within the standard duration (four semesters), you have the possibility of extending your studies by one semester (in total five). You do not have to submit a special request, but merely to re-register for the next semester (see 3.4 Re-registration). If you need more than five semesters for your Master's, you have to hand in a petition for extending your studies to Mrs. Jahreis of the Examinations Office and explain why this extension is necessary. You can then re-register as usual; your petition for extension should be submitted to the Examinations Office until September 20th (for the winter semester) or March 20th (for the summer semester). The form can be found here.

3.19 Switching Your Degree Program or University

If you wish to switch from Medical Engineering to a different degree program, you can consult the study advisory Medical Engineering for a first orientation. Requests for accreditation of academic achievements from Medical Engineering to a different degree program must be discussed with the respective study advisory and/or accreditation representative of the new study program (see <u>8 Useful addresses and contact persons</u>). If you intend to transfer to another university, please consult the corresponding contacts there.

Should you be interested in switching to a degree program of a different Faculty at FAU or do not have any exact plan, you can consult with the advisors of our central Student Advice and Career Service (IBZ, see <u>8 Useful addresses and contact persons</u>).



4 Students in Special Situations

4.1 Students with a Chronic Condition or Disability

Prospective and current students with a disability or a chronic condition are entitled to special support. Disabilities are categorized by physical, mental or psychological impairments with symptoms lasting longer than six months. This includes mental conditions or dyslexia. Included in chronic diseases are all impairments that have been receiving at least one medical treatment per quarter for one year (e.g. migraine).

As the process of admission for the Master's degree program Medical Engineering may be conducted by an entry examination, applicants with disabilities have the possibility to request compensation for their impairment and a subsequent adjustment of the examination conditions (e.g. by adding more time for the examination).

A compensation of disadvantages is also possible for exams during the course of study. Please contact the head of the Student Advice and Career Service (IBZ, see <u>p. 8 Useful addresses and contact persons</u>) Dr. Gündel at the latest 6 weeks before the beginning of the examination period. He can tell you in detail what a medical certificate must look like in order to receive compensation for disadvantages. Once the certificate is submitted and the compensation is greenlighted, Mrs. Jahreis of the Examinations Office will issue an appropriate document which should be handed in at the department where your examination takes place as soon as possible. This is necessary to organize the compensation, e.g. by seating you separately during the exam, as you will be less disturbed by students leaving sooner.

Additional tips and assistance as well as independent advice centers can be found here (in German): https://www.werkswelt.de/index.php?id=studieren-mit-behinderungen-und-chronischen-krankheiten

https://www.barrierefrei-studieren.de/

If you are unsure of issuing a request for compensation, you can contact the study advisory Medical Engineering. Your request will always be handled confidentially!

4.2 Studying During Pregnancy or with Children

As a pregnant student, you enjoy certain protection. Pregnant students, who can prove with a doctor's certificate up to four weeks before an exam that they are in their 30th week of pregnancy andare not able to take the exam under the usual condition are entitled to perform the exam in a differentmatter or arrange an extended exam period with their professor and the Examinations



Office.

Special leave of absence conditions also account for students with children:

Parent students can request a maternity or parental leave. The leave of absence is valid from the birth of the child until the completion of its third year (in total not more than six semesters). It is possible to postpone twelve months of this parental leave (two semesters) to a point later on until the eighth year of the child.

Furthermore, a student can take up to two vacation semesters (due to different reasons: stay abroad, internship, see <u>3.16 Leave of absence</u>) that are not included into the maternity or parental leave.

If you have difficulties meeting your exam date, there are different options for you, e.g. the Family Service offers childcare during the exam time in cases of emergency or if you cannot attend the exam due to a family emergency, you can request prompt repetition dates.

If you are interested in consultation or more information, e.g. on childcare offers at the university or living arrangements for student parents, you can make use of the Family Service of FAU (see <u>8</u> <u>Useful addresses and contact persons</u>). Information on financial aid for students with children can be found here: www.studentenwerke.de/en/content/studentenwerke-establish-family-friendly.

4.3 Psychological Consultation

Studying at university sometimes also means having to deal with high levels of stress. Test anxiety, difficulties with time management (procrastination) or doubts if one has chosen the right degree program are a couple of examples for situations that can be burdensome for students. Conflicts with your partner, family members or fellow students can be difficult to handle, too.

FAU students with these or different problems can contact the psychological advisory at the *Studentenwerk* (Association for Student Affairs) (see <u>8 Useful addresses and contact persons</u>), which also has an office at the Faculty of Engineering. During your first conversation, you are not required to give personal details, as it is non-committal and free of charge. The counsellors are trained psychologists and familiar with student specific issues. It does not matter what weighs on you, you will soon discover that you are not alone with your problems.



4.4 Part-time Studies

It is possible to study the Master's degree Medical Engineering part-time, with half of the time and workload in which case your number of semesters doubles. Per study year, students can complete up to 35 ECTS credits. The standard duration of the degree program is therefore set to eight semesters with the possibility to extend two more semesters. The Master's thesis work period consists of 12 months. The content of the degree remains identical to the full-time studies.

You choose your type of studying (full time or part time) while enrolling for the Master's degree program. Switching between part and full time is possible once per study year and requires a written petition to the Student Records Office. After three full-time semesters, a switch to part time is only given in justified cases. A switch to gain more time for the Master's thesis is therefore not possible. This offer is directed to professional athletes or students with children, health conditions, and caregiving tasks or with an active job. The part-time schedule, however, does not take place in the evening or on weekends, i.e. you must attend the regular classes with full-time students taking place during the day and the entire week. The part-time studies therefore should only be considered if you can set your workhours flexibly.

International students who require a study visa must clarify with officials of the foreign office if a part time study program is permitted. In general, a residence permit is only issued for full time studies.

4.5 Double Degree

Some Medical Engineering students are interested in the option for a double degree in their Master's. They would like to study the Master's Medical Engineering at the same time as a Master's program and to integrate identical academic achievements (if available) in both degree programs, e.g. the Master's thesis if the program and examination regulations (FPO) allow it. In general, this is possible, but must be considered with care.

For a double admission, a formal petition at the Student Records Office must be made and approved by the deans of the faculties in question. Apart from the regular admission requirements (i.e. language levels and subject-related requirements), you must first justify that you have a special interest - professional or academic - in the joint completion of both of your desired degree programs. Secondly, you must verify that you are able to complete both studies without overlaps and within the standard duration. Please take in mind that a double study is not a reason for an extension of your study period and you might receive worse grades due to the higher workload.

Students in Special Situations

Because of the second condition rarely being met, it is recommended to first complete one Master's degree program and then begin the second one, to which many academic achievements of the first Master's can be accredited to (see 3.17 Accreditation of academic achievements). The respective Officer of Accreditation of Academic Achievements is responsible for this accreditation (see 8 Useful addresses and contact persons). However, please take note, that in your second Master's certificate the double credited achievements are indicated with "accreditation from previous studies" and ask yourself if this will really give you an advantage in the job market.



5 Online Tools

5.1 IdM-Portal

The IdM-Portal is where you log in first after enrollment. For this, you will need the activation code you have received from the Student Records Office after submitting all enrollment documents and paying the semester fee. You will receive your personal user identification and password via post after paying the fee. With this user identification, you activate your IdM account and must upload a photo of yourself for your student card (FAU-card), which you can use e.g. for paying in the cafeteria or using the library services. After completing this step you will receive your FAU-card within the following four weeks (if you already reside in Germany; if not you can pick it up after your arrrival). The IdM-Portal contains your general user data, e.g. you can check for which services your card is activated under the category "Services". The button "Requests/Tasks" allows you to block your FAU card if you happen to lose it. The email forwarding function allows you to redirect the emails you receive at your @fau address to another email address (Home » Profile » Data overview: relaying to a different email address). If you do not use your FAU email account regularly, please use the relaying service in order not to miss important information! Another one of your first steps in the IdM-Portal should be to activate the library services of your card by clicking on "Requests/Tasks", "FAUcard", "Library account activation" and follow the steps. The activation of your library account may take one to two working days. On the first page of the IdM-Portal, you have the possibility to subscribe to newsletters or cancel them.

5.2 CIP-Pool Account

CIP Pools are open computer rooms located across the university. However, if you install an account via the Computer Science Department's CIP pool team, you can only access the CIP pools of the Department of Computer Science (blue tower). In the first two weeks of the lecture period, you have the possibility to log in to any of the Computer Science's CIP Pools using the login name and password "cipan" and let the system give you a step-by-step instruction, to install your account. You get find additional help for the process from the CIP pool admins. Please find further information on their website.



5.3 UnivIS

The university's information system (http://www.univis.fau.de/) is a large database you can use to search for your courses, including their contents, registration and examination types and ECTS points. Another helpful service of UnivIS is the search function for persons or rooms with which you can find information on every employee of FAU (with address, telephone number and email address) or the location of the lecture halls and rooms. A lesser-known function is the events calendar and the job offers section for FAU, which can be very interesting if you are looking for a part-time job as a student assistant or a doctoral position.

UnivIS also helps you in creating your individual class schedule by selecting the study program "Medical Engineering". You can also generate your individual schedule and save it as a PDF-document. You can find a more detailed instruction here: https://www.medical-engineering.study.fau.eu/current-students/general-study-information-masters-program/

5.4 StudOn

<u>StudOn</u> is the e-learning platform for all FAU students. You have your personal desktop on which you can administrate the courses and groups for which you are registered. In these courses, you can access study materials have the possibility to interact with the lecturers and tutors, as well as with other students. Your lecturer will point you to the corresponding StudOn group at your first lecture.

5.5 Campo

The Campo portal is used for the Master application and administrating the enrollment at FAU please do not confuse it with *Mein Campus* (see below)!

5.6 Mein Campus

MeinCampus (https://www.campus.uni-erlangen.de/qisserver/rds?state=user&type=0) provides an abundance of administrative functions. Throughout the course of your studies, you will need the platform to register and cancel your exams. You can also print your certificate of enrollment, overview of grades and your BAföG certificate (see 3.5 BAföG). Most of the grades of passed exams are directly registered in Mein Campus. In the navigation bar "Studentenkanzlei aktuell" (current news Student Records Office) you are able to find the information you will need to pay the semester fee



while re-registering (see <u>3.4 Re-registration</u>). You can find a more detailed instruction with screenshots for *Mein Campus* at

https://www.medical-engineering.study.fau.eu/current-students/general-study-information-masters-program/

5.7 Virtual University of Bavaria (VHB)

The Virtual University of Bavaria is a cooperation between Bavarian universities offering a wide range of online courses, which is free of charge for students enrolled at a Bavarian university. The VHB gives you the opportunity to take different courses simultaneously to your studies at FAU and schedule you study time more flexibly. This is an advantage if you have frequent overlaps in your schedule or if you generally prefer studying from your home. Some of the VHB courses are a part of the module catalogs of Master's program Medical Engineering. Every graded course that finishes with an **on-site exam (or an online exam with identity control)** can be used for the Master's module "Free Choice Uni (M8)". You will also find the conditional course "Advanced C++ Programming" there, which is offered as a VHB course.

In order to participate, you must first register on the VHB webpage (<a href="www.vhb.org/en/"www.vhb.org/en/"www.vhb.org/en/"www.vhb.org/en/"www.vhb.org/en/"www.vhb.org/en/ homepage/). Select the status "Student einer Trägerhochschule" (student of a participating university) and "Gesundheitstechnik" (Health Engineering) as your degree program (category "Studienfach"). You will be guided through the further registration process. The VHB homepage informs you about the courses available and the registration and examination details. Parts of the VHB website are only available in German but you can find a user's manual on the Medical Engineering website: https://www.medical-engineering.study.fau.eu/current-students/general-study-information-mas-ters-programme/.

5.8 Video Platforms

The FAU currently has two platforms: https://www.fau.tv/, an offer of the FAU Computer Centre and video.cs.fau.de/, supervised by the Student Association for Computer Science (FSI Inf). Both platforms contain past and upcoming lectures held at FAU. The videos can also help you to prepare for exams and give you the opportunity to repeat the lecture's content, especially if you intend to take the exam to a winter semester course in the summer semester or vice versa.



5.9 Important Websites

For questions concerning your studies, you should first consult the Medical Engineering homepage (https://www.medical-engineering.study.fau.eu/) where you can also find an **FAQ section**. The information on the homepage is available in English. The archive offers a collection of module catalogs from former semesters that can become helpful at the end of your studies to decide which module can be used for which module group. When in doubt, consult the archive to see which module group a module belonged to at the moment when you first took the exam.

The events calendar of the Faculty of Engineering's website keeps you informed on recent talks, training events for entering the job market or job fairs.

https://www.fau.de/veranstaltungen/veranstaltungen-der-technischen-fakultaet/

5.10VPN Client

The VPN-Client (Virtual Private Network) offers you the possibility to access the university's network and its services from your home. In most cases, it is sufficient to install the Cisco-VPN of FAU's Computation Centre, which can be downloaded for different operating systems at the Computer Center's website (www.rrze.fau.de/dienste/internet-zugang/vpn/cisco-vpn.shtml (in German).

By using this method, you cannot only access software provided by the Computer Center to enrolled students, but you can also use the wide range of e-books and online publications offered by the university library.



5.11 Overview: Which Tool Is Used for What?

Online tool:	Features:
IdM portal	General user information
	FAU-Card features
	Blocking FAU-Card if lost
	Redirecting e-mails
	(Un-)subscribe university newsletters
UnivIS	Search for classes and modules
	Search for people and rooms
	Creating personal class schedule
	Events calendar
	Job offers
StudOn	Platform for communication and studying
	Study and exercise material
	Forums for individual classes
Campo	Application for study program and enrollment
Mein Campus	(De-)registering for exams
	Exam dates
	BaföG certificates
	Certificate of
	enrollment
	Overview of grades
	Information on re-registration process



6 Student Life

Of course, your study experience does not exclusively revolve around ECTS credits, modules and exams. Especially the Faculty of Engineering usually makes a great effort in offering social events. There are many parties and events in the south campus buildings and outside depending on the season. Not only the famous TechFak summer party is a big event, but also the parties organized by the student associations (FSI) of the different study programs or other student organizations. The student association FSI Medical Engineering (7 Glossary - important terms for studying Medical Engineering) holds summer and Christmas events, the FSI Computer Science is famous for their crypto parties and in December, the ETG Kurzschluss shows the classic German movie "Die Feuerzangenbowle". To keep yourself informed on the events, keep your eye out for posters and bills or subscribe to the mailing list of the respective organizers. If you want to involve yourself personally, help out at the events or are interested in meeting new people, you are very welcome to join the FSI Medical Engineering or any other student organization. You can find more information on other events, e.g. FAU sport activities, Erlangen's nightlife and the FAU FabLab, where students can work on their own technical projects, in the first-semester information booklet (also available in English) of the FSI Medical Engineering which is handed out in the FSI room or at the study advisory office.



Figure 5: summer event of the FSI Medical Engineering



7 Glossary - Important Terms for Studying Medical Engineering

Compulsory modules and Conditional Subjects

You have to complete certain mandatory modules; these include the conditional subjects and the compulsory modules which teach obligatory skills (see footnotes in your module catalog). You have one year to pass your conditional subjects, no matter whether you withdraw from an exam due to illness or other important reasons. The deadline for completing your conditions cannot be extend due to German law. You have three attempts in order to pass all other modules.

Regular Modules of your study program

The modules for your study program mostly consist of a preselected list for a respective module group. You can choose the modules you want to take within the list. At the end of your studies, enough modules must be passed successfully to fulfil the ECTS requirement for the group. If you fail an exam for one of these modules, you are usually obligated to repeat the exam in the following semester. However, you can switch your registration for the repeat exam to a new module from the same module group by sending an email to Ms. Jahreis of the examinations office during exam registration. Please note that the number of failed attempts for the old modules is subtracted from the number of possible attempts for the new one.

Examination Regulation (FPO)

The examination regulation Medical Engineering (FPO MT) contains discipline-related regulations for the examinations of the Bachelor and Master degree program Medical Engineering. If the FPO does not state any guidelines, the general degree regulations of the Faculty of Engineering ABMPO apply (see below). At the moment, the degree program Medical Engineering has different FPO-versions: If you have started your Master studies on October 1, 2019 or after, you are studying according to the FPO version of 2019.

ECTS Credits

ECTS stands for European Credit Transfer and Accumulation System, which was introduced to measure the workload of students and compare study performances Europe-wide. The ECTS



credits a student receives for completing a course are in relation to the required workload. One ECTS credit equals a work-load of roughly 30 hours. The total workload for a Bachelor's degree is 180 ECTS credits and for a Master's degree 120 ECTS credits. **There is no minimum of ECTS credit points that must be acquired per semester.** It is recommended to achieve around 30 ECTS points per semester to complete your studies in the standard study period, which can be important for *BAföG* recipients (3.5 BAföG).

Electives

Electives can be chosen from the entire course selection of FAU (from all faculties) and the Virtual University of Bavaria (VHB). The module "Free Choice Uni" (M8) of the Master's degree program is an elective module. Please note that you can only use **graded** coursework **acquired through onsite exams or online exams with identity control** for this module.

Examinations Committee

The examinations committee of the Faculty of Engineering is responsible for all important case-by-case decisions regarding the degree program and examinations. The committee meets twice per semester and discusses specific cases. Urgent decisions can be made directly by the presiding members. If you intend to appeal a decision (e.g. regarding the denied accreditation of academic achievements or a questionable grade) you must approach the examinations committee. You can forward your inquiry via email to Ms. Jahreis of the Examinations Office.

General Degree Program and Examination Regulations (ABMPO)

For Medical Engineering students the ABMPO TF - the General Examination Regulations for the Bachelor's and Master's degree programs at the Faculty of Engineering apply. The documents can be found in German and English at the link section of the Medical Engineering website. The ABMPO contains essential regulations for all study programs of the Faculty of Engineering and is complemented in discipline-related questions by the degree program and examination regulations FPO (see above).

Module

One module is a chronologically and thematically connected and teaching and learning unit, the contents of which are tested in an examination (for the different exam types see <u>3.9 Exams</u>). Colloquially the term "subject" is used for describing a module. For example, the module or subject



"Engineering Mathematics" contains an eponymous lecture and exercise. Please read the module catalog carefully especially the footnotes.

Module Catalog

The module catalog complements the Master's study plan template. Unlike the study plan template, it is not regulated by the program and examination regulations (FPO) and can be changed every semester by the Study Commission. Once a new catalog is completed, it will be published on the Medical Engineering website (usually at the beginning of every semester). The current catalog determines which modules are available in the ongoing semester. The catalogs of previous semesters can be found in the catalog archive on the Medical Engineering website for your consultation.

Module Descriptions

The module descriptions determine which content is to be taught, which learning goals are defined and which qualifications a student should acquire from the module. Furthermore, they indicate the examination type for the module and how many ECTS points it is worth. Usually, you can find the module description for your degree program in the module handbook or in the lecture list search on UnivIS. The module descriptions are especially important if you are interested in studying abroad or are seeking the accreditation of external achievements in exchange for the FAU Medical Engineering modules (see 3.17 Accreditation of academic achievements).

Module Group

The different modules of a branch of study are combined to module groups with an individual name and number (the M stands for the Master module groups). Some module groups represent a thematical unit, others are a placeholder to choose different possibilities (e.g. M7 "Flexible Budget Faculty of Engineering"). An overview of the Master module groups can be found in the module catalog (https://www.medical-engineering.study-information-course-syllabus-fpo-2019/) on the Medical Engineering homepage.

Module Handbook

The module handbook for the master's degree program Medical Engineering contains all module groups and their respective modules. You can generate the current module handbook for your



Master's program based on the most recent data from UnivIS. But beware, if a course has not been registered correctly in UnivIS or was not tagged as a Medical Engineering course, then there is a possibility that it will not be listed in the module handbook for Medical Engineering. It is therefore important to always study both the module handbook and the module catalogs and, if necessary, search for classes that may be missing in the module handbook in UnivIS. If you cannot find a module that is listed in your current module catalog in UnivIS, please contact your study advisor.

Practical/Laboratory Training

Practical/Laboratory training takes different forms in the Medical Engineering degree program: a practical class with mandatory attendance, which usually takes place in the laboratory (Academic Laboratory), an internship in an industrial company (voluntary for Master's students) and the Research Laboratory, a practical research project at a university chair.

Program Structure/Master's Study Plan Template

There is no dictated schedule in the Master' program for Medical Engineering. The study plan template gives you an overview of the required module groups and the overall ECTS credit points you must achieve for completing a module group (2.3.3 Course of study). Your module catalog tells you which courses you can select for each module group. The program and examination regulations (FPO) Medical Engineeringregulate the Master's study structure. The version you started with (since Oct. 2019: FPO 2019) applies for the whole period of your studies.

Student Association Medical Engineering (FSI MedTech)

The student association FSI MedTech is a collective of students who represent the interests of all Medical Engineering students. The FSI also has members in the Study Commission Medical Engineering in which important decisions for the degree program are made. The FSI is also your student contact for peer counseling regarding your studies, e.g. if you need old exams in order to practice for your own exam, if you have questions about certain modules or professors or if you need help or tips on general topics. For these types of questions, a weekly consultation hour is offered, the exact time can be found on the FSI homepage. Of course, you can just stop by the FSI room (01.150 in the blue tower) and talk to your fellow students. The FSI regularly organizes information events, e.g. welcome events of other information events. They are also responsible for the social life of the Medical Engineering students and throw a variety of parties where you can meet fellow students from higher semesters and have of course the opportunity to actively participate yourself



(8 Useful addresses and contact persons).

Study Commission Medical Engineering (StuKo MT)

The Study Commission Medical Engineering is responsible for all decisions concerning the study admission, the program and examination regulations and the module catalog for the degree program Medical Engineering. The Study Commission meets twice per semester. Members are the head of the Study Commission, four representatives of the student association FSI Medical Engineering, the study advisor and other people who are involved in the organization of the degree program. The commission's topics are general problems in the degree program and adapting the courses of the module catalog if necessary. You can actively participate in the commission's topics as a student by contacting the study advisory or the FSI Medical Engineering with your problem or concern, who will represent your interests in the Study Commission. The site https://www.fau.eu/fau/organisation-and-committees/ gives an overview over all commissions participating in university politics at FAU.

SWS (Semesterwochenstunde)

SWS stand for the weekly lecture hour and indicates the duration of a class. An SWS is equal to 45 minutes, many lectures consist of 2 SWS units, but longer periods for tutorials and practical courses are possible. By successfully completing a class of 2 SWS units (through a written exam or otherwise) you will usually receive 2.5 ECTS credit points, for a class of 4 SWS units usually 5 ECTS credit points. If your course is accompanied by additional tutorials or project work, you can receive up to 7.5 or 10 credit points. However, there is no direct correlation between SWS units and ECTS credit points because the workload for the preparation and follow-up work of a class varies strongly, hence the workload does not only depend on the time you spend in class.

TNZB (Technisch-Naturwisssenschaftliche Zweigbiliothek)

The Science and Technology Branch Library (TNZB) is a branch of the Central University Library and is located on the southern campus. It includes books, magazines and other publications of the field of science and technology. In order to borrow books, you must have a student ID (FAU card) that is activated for library services (see <u>5.1 IdM-Portal</u>). The service team of TNZB offers frequent library tours in English tointroduce the students to literary research.

ZiMT (Zentralinstitut für Medizintechnik)

The Central Institute of Medical Engineering (ZiMT) functions as a bridge between research,



teaching and business in the field of Medical Engineering. The ZiMT team also coordinates the admission process, in which the qualification of applicants for the Bachelor and Master's degree program is evaluated and offers interesting classes and lectures each semester. Moreover, it organizes additional interesting events such as hackathons, business pitch events etc.



8 Useful Addresses and Contact Persons

BAföG office (federal education assistance)

Hoffmannstraße 27 91052 Erlangen

Tel: +49 (9131)/80-02900

BAföG representative Medical Engineering

Prof. Tobias Reichenbach

Claudia Barnickel (deputy)

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E-Mail: claudia.barnickel@fau.de

Canteen (meal plan)

http://www.werkswelt.de/index.php?id=mensen-cafeterien-cafebars

Central Institute of Healthcare Engineering (ZiMT)

Henkestraße 127 91052 Erlangen

https://www.zimt.fau.eu/

Tel: +49 (9131)/85-26861 Fax: +49 (9131)/85-26862 E-Mail: zimt-office@fau.de

Central Office for International Affairs (RIA)

Helmstraße 1 91054 Erlangen

https://www.fau.eu/international/central-office-for-international-affairs/

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EEI: Dr.-Ing. Christian Carlowitz

MB: Dr. Oliver Kreis

WW: Frau Susanne Michler INF: Dr. Zinaida Benenson

CBI: Dr. Anna Hilbig

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Useful Addresses and Contact Persons

Family Service of FAU

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www.familienservice.fau.de (in German)

FAU-Card ServiceOffice

https://www.fau.eu/study/programme-start/faucard/

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E-Mail: fsi-eei@fau.de

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https://fsi.cs.fau.de/dw/ (in German)

FSI Medical Engineering

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E-Mail: fsi-medtech@cs.fau.de

Facebook: FSIMedizintechnikErlangen

www.medtech.fsi.fau.de

Language Centre (SZ)

www.sz.uni-erlangen.de/

International Office of the Faculty of Engineering

Erwin-Rommel-Straße 60

91058 Erlangen

https://www.tf.fau.eu/person/

international-office-tf/

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Useful Addresses and Contact Persons

Legal advice (examination regulations, tenancy law, labour law, etc.)

Hofmannstraße 27 2nd floor, room 201 91052 Erlangen Andreij-Sacharow-Platz 1

2nd floor, room 2.332 90403 Nürnberg

http://www.werkswelt.de/index.php?id=rechtsberatung&setlang=en (in German)

Lost and found (Faculty of Engineering)

https://www.tf.fau.de/infocenter/fundbuero/ (in German)

Mein Campus Support:

Tel: +49 (9131)/85-20100

E-Mail: meincampus-support@fau.de

Office for Gender and Diversity

Bismarckstraße 6

3rd floor

91054 Erlangen

Tel.: 09131 85-22951

E-Mail: gender-und-diversity@fau.de

Guidelines for dealing with

sexual harassment:

https://www.gender-und-diversity.fau.de/files/2017/06/richtlinien_sexuelle-belstigung 2017 04 20.pdf

Office for internships EEI

<u>Alexandra Winkler</u> (secretary)

Cauerstraße 7

Room 01.034

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langen.de

https://www.eei.tf.fau.de/studium/praktikum-

samt/ (in German)

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Claudia Barnickel

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Technology (ET), Engineering for teaching:

Dipl.-Ing. Almut Churavy

Mechanical Engineering, Mechatronics:

Dr.-Ing. Oliver Kreis

Computer Science:

Prof. Dr. Christoph Pflaum

Computational Engineering:

Prof. Dr. Ulrich Rüde

Life Science Engineering, Chemical

Engineering and Bioengineering:

Dr.-Ing. Anna Hilbig,

Prof. Dr.-Ing. Malte Kaspereit



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Elizabeth Provan-Klotz, certified Psychologist, Psychological Psychotherapist South Campus Erlangen, Martensstraße 3 Consultation in German and English Blue Tower (room 04.154)

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Student Advice and Career Service (IBZ)

Room 0.021

Tel: +49 (9131) / 85-24444 or 85-23333

www.fau.eu/study/prospective-students/

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Student Records Office

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(only during the lecture period additionally: Wed

2 - 4 p.m.)

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kontakt/ (in German)

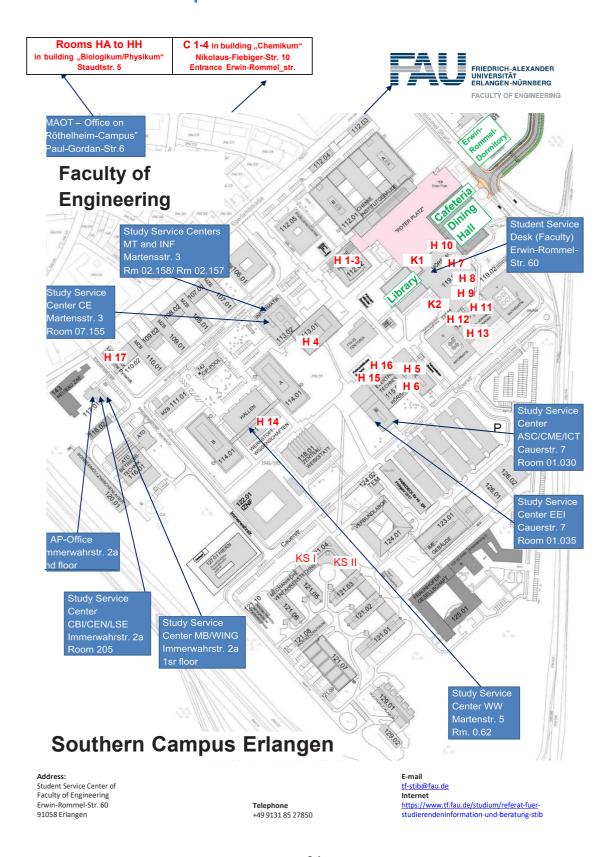
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University sports

https://www.hochschulsport.fau.de/

9 Map



Figures of front cover (from left to right): FAU/David Hartfiel; FAU; Kurt Fuchs; Chimaera/Dieter Hahn Figure on side banner: Andy Brunner/Kaletzsch Medien

Figure 1: FAU

Figure 2: Bastian Stahl Figure 3: ZiMT

Figure 4: Bastian Stahl

Figure 5: Claudia Barnickel

Figure 6: FAU

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