Autonomy Technologies
(AT)

Study Guide WS 2025

Contents

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Department of Electrical Engineering (EEI)
Department of Computer Science (INF)
Department Artificial Intelligence in Biomedical Engineering (AIBE)

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Introduction

Trends - Why study Autonomy Technologies?

Around the world, many innovations can be traced back to the increased, efficient automation of technologies and its intelligent processing. In most electronic devices, diverse components must interact with each other. Both hardware and software skills are needed to successfully develop such systems. Therefore, Autonomy Technologies combines the most important subfields from the disciplines of electrical engineering, automation, control systems, computer science and medical engineering.

Autonomy Technologies engineers are constantly opening up new and diverse fields of activity. They work on the development and research of:

- Innovations in automotive technology (autonomous driving, e-mobility, car-to-x communication, etc.)
- Automation and robotics
- Mechatronics and embedded systems
- Artificial intelligence and machine learning
- Communication and networking technologies (including mobile communication)
- Medical and biomedical engineering (robot-assisted surgery, digital health, etc.)

Most tasks and products in a wide variety of high-tech industries can only be solved or designed with the help of cross-sectional technology as taught in Autonomy Technologies.

Concept

Interdisciplinary training is provided by the three departments "Electrical Engineering", "Computer Science" and "Artificial Intelligence in Biomedical Engineering (AIBE)" of the Faculty of Engineering. In addition, there is a basic part in which necessary, predominantly mathematical basic knowledge is taught across the disciplines.
The computer science and artificial intelligence component focuses on application-oriented computer science fundamentals, numerics, and simulation, whereas the electrical engineering basic modules include the fundamentals of electrical engineering, control systems, digital communication and signal processing. Algorithms form a central component in all of these areas. A special emphasis is put on introducing artificial intelligence and machine learning components in the single disciplines already on bachelor level.

The following specializations are available:

- Human-System Interfaces
- Networking & Collaboration
- Planning & Control
- Sensing & Perception

First hands-on professional experiences in these domains can be gathered in a team project at the university or in industry or an external research institution (10 ECTS credits).

Autonomy Technologies bundles the extensive competences of FAU on electrical engineering, mechatronics, computer science, and artificial intelligence and represents a highly attractive offer for outstanding national and international students. Graduates of the program will thus be competent engineers in the rapidly growing field of autonomy technologies.

Career Prospects

Graduates of the Autonomy Technologies program are ideally prepared to work in research and development in industry or academia in the fields of electrical engineering, mechatronics, computer science, and artificial intelligence. AT graduates are trained generalists rather than specialists and are sought by many companies, leading to extremely positive labor market forecasts.

The Erlangen-Nürnberg metropolitan region is home to many leading companies in energy technology, electrical engineering, automotive automation and robotics, communications, or industrial services. FAU is also closely working together with renowned research institutions in the metropolitan region that offer excellent prospects for young scientists. For instance, the Fraunhofer Institute for Integrated Circuits, the "Home of MP3", together with the Department EEI, forms the International AudioLabs Erlangen, a worldwide unique research center for audio and multimedia technologies. Another important institution is the Medical Valley European Metropolitan Region Nürnberg (EMN) as one of the economically strongest and scientifically most active medical technology clusters of excellence worldwide. Famous companies such as Siemens, Schaeffler, Continental, Adidas, Diehl and many others are also closely networked with the Faculty of Engineering.

The Study of Autonomy Technologies

The study of Autonomy Technologies (AT) at the Friedrich-Alexander University Erlangen-Nürnberg takes place as a consecutive Bachelor's/Master's program. The language of instructions is English.

Training Target

The goal pursued with the Autonomy Technologies degree program at the Faculty of Engineering is to educate

practice-oriented engineers with comprehensive theoretical and skills that enable research at the highest international level.

With the methodological skills and expertise acquired through the training, they should be able to independently and responsibly solve the engineering tasks arising in their areas of activity at the interface between the fields of electrical engineering, automation, control systems, computer science and medical engineering, as well as to develop and critically assess new findings in their field.

Training Path

The bachelor's degree program in Autonomy Technologies is composed of modules spread over six semesters. This includes lectures, labs, seminars and 5 months for the completion of the bachelor's thesis. The examinations in the first two semesters are part of the preliminary examination (Grundlagen- und Orientierungsprüfung GOP). Passing this exam is a prerequisite for further studies.
In the fifth and sixth semesters, in-depth study takes place through the selection of elective modules. After completion of all modules and the achievement of 180 ECTS credits, the academic degree

Bachelor of Science

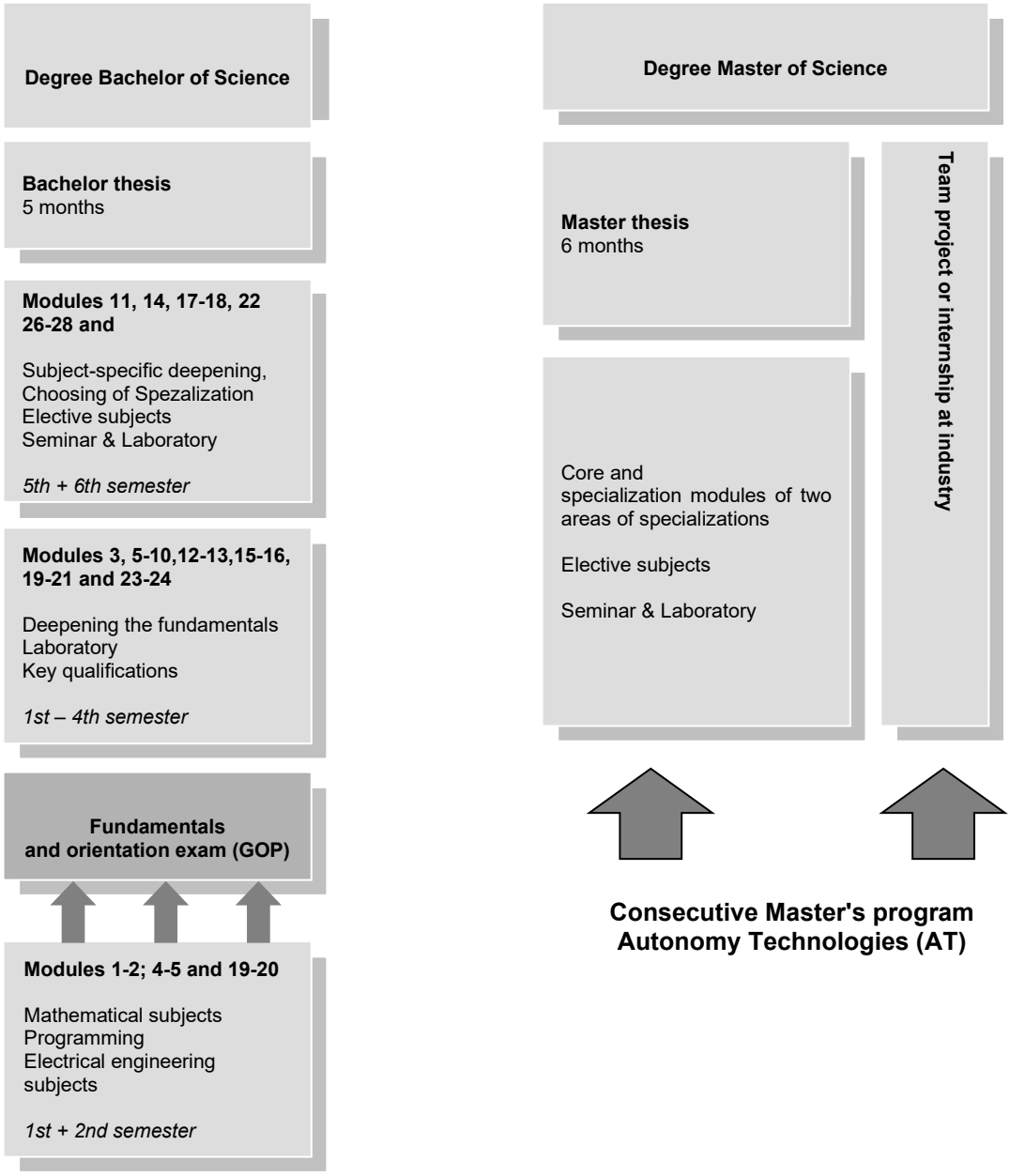
abbreviated (B.Sc) is awarded.

Upon completion of a consecutive master's degree program, the academic degree

Master of Science

abbreviated (M.Sc) is awarded.

Overview of the Study of Autonomy Technologies (detailed study plan see p. 62)



The basis for the study of Autonomy Technologies at the Friedrich-Alexander-University Erlangen-Nürnberg are the following regulations:

- General Degree Program and Examination Regulations for the Bachelor's and Master's degree programs at the Technical Faculty of the University of Erlangen-Nürnberg (ABMPO).
- Degree Program and Examination Regulations for the Bachelor's and Master's Degree Program in Autonomy Technologies at the University of Erlangen-Nürnberg (FPO).
- Guidelines for the industrial internship training of Autonomy Technologies students at the Friedrich-Alexander University Erlangen-Nürnberg (Internship Guidelines) – see page 62

Information for the First Semester

Start of studies and admission to the bachelor's program

The Autonomy Technologies bachelor's program at the University of Erlangen-Nürnberg can only be started in the winter semester, since the cycle of courses is based on an annual rhythm. Lectures in the winter semester usually start in mid-October.
Applications for the bachelor's program can only be made via the **Campo** application portal.

The application deadline for the winter intake ends

- on 15 July for **international** applicants
- on 31 August for **national** applicants

National applicants need to upload the required documents at the Campo application portal. Further information can be found here: www.fau.de/education/bewerbung/zulassungsfreie-faecher/

International applicants need to send the application sheet by post to FAU after their application via Campo. You can find a list of all the required documents that need to be upload in Campo here: https://www.fau.eu/education/international/from-abroad/application-and-enrolment/#collapse_0. Please notice that international documents have to be certified by the local embassy.

International applicants must be aware that the secondary education qualification from their school in your home country does not necessarily entitle them to study at a German university. International applicants might have to take an assessment examination (*Feststellungsprüfung*) before they can be admitted. Information on the types of international university entrance qualifications and the type of access to university can be found here.

If international applicants are not sure whether your educational background can be considered a University Entrance Qualification in Germany please visit the website of the German Academic Exchange Service (DAAD). By stating your home country, and qualifications obtained there, and by answering some country-specific questions you can find out whether you are eligible to study in Germany.

Depending on the school-leaving qualification applicants from some countries might be required to have studied for one academic year as a full-time student at a recognised higher education institution according to the given study regulations. Please see the information for your individual school-leaving qualifications on the website of the DAAD.

Qualification Assessment Test (QAT)

In order to be allowed to study AT at FAU, all applicants need to pass the Qualification Assessment Test.

Here you can find the regulations of the QAT: German Version English Version

Enrollment in the Bachelor's program (matriculation)

An enrollment must first be made on Campo via the enrollment request and by sending the required documents to the enrollment office from the end of July on until the end of September.
You can find the enrollment times and further information here: https://www.fau.eu/education/application-and-enrolment/deadlines-and-documents-for-enrolment/

Documents to be submitted for enrollment include:

1. Enrollment application (after completed online registration)
2. Identity card or passport
3. Proof of university entrance qualification
4. Admission letter
5. Enrollment request
6. Proof of statutory health insurance
7. Proof of payment of the semester fee. The amount must be transferred before

Duration of lectures

FAU semester dates: https://www.fau.eu/education/study-organisation/semester-dates/

A teaching hour lasts 45 minutes. A semester hour (SWS) is one teaching hour per week during the lecture period of a semester.

Introductory events

On the first day of lectures of the winter semester, a central introductory event of the Faculty of Engineering takes place. The introduction to the study of Autonomy Technologies is taking place at the same time.

"Campo"

This online platform serves as the online administration of the admission office, the student record office and the examination office. This includes dates, times and places for all current and past modules. The campo portal covers the organisation of applications, admissions and enrolments through to the administration of students, courses, examinations and grade booking, modules and rooms. Students have to administrate their study data there and to register for examinations (if one has failed in an examination he/she has to re-register again; there is no automatic re-registration). The registration period starts normally in the mid of November/May and lasts about two weeks. On this platform, students can review their current grades and view their transcript of records. Beyond that, campo enables the printing of enrollment certifications and the remittance form for every semester. International students can

find also the *"Confirmation for submission to immigration authorities"* in campo in order to extend their visa.

"FAUdir"

The University Information System of the Friedrich-Alexander-University, short "FAUdir" serves mainly as a directory of persons and telephone numbers. FAU students should use the internal search.

"StudOn"

StudOn, FAU's central learning platform, contains materials and communication options that lecturers provide for specific courses. In addition, student groups can set up their own areas for file exchange, forums, chat rooms, and groups.

Current information on the study of AT

Information about events, important information about the study program and further links can be found on the homepage of the AT program at www.at.study.fau.eu/category/news/

Exams

At the Faculty of Engineering, examinations are held regularly in the following two periods (6 weeks in total):

- in the two weeks after the end of the lecture
- in the four weeks before the beginning of the following lecture period

Examinations at other faculties sometimes take place in other periods. If you have to retake an exam, the retake date can be in the exam period of the following semester already.

IMPORTANT: You have four attempts to pass an exam (exception: GOP preliminary examination). If an exam is not passed within four attempts, the entire course of study is considered failed and you will be exmatriculated. The thesis needs to be passed within two attempts.

The Examinations Office is available to assist you with all questions concerning the registration and conduct of examinations and the registration of examination results and the preparation of certificates.
Contact person for AT is Ms. Whitney Reed.

Compensation for disadvantages due to chronic illness and disability

Students with disabilities or chronic illnesses can apply for disadvantage compensation for exams (e.g. longer processing time, approval of aids). This applies to all physical and mental impairments that last at least 6 months, as well as to illnesses that require at least one medical treatment per quarter over the course of a year. A severe disability certificate is not required for compensation. Furthermore, the disadvantage compensation also does not appear in the

certificate documents. If an application for disadvantage compensation is an option for you, you can find more information on the following link: www.fau.eu/education/advice-and-services/support-services/students-with-disabilities/

Note on withdrawal from exams

First attempts can be postponed (withdrawal/cancellation no later than three working days = Monday to Friday, excluding holidays, before the exam date). You carry out the withdrawal via the campo portal. With the withdrawal, the registration expires and you have to register for the exam again in the new semester.

In addition, you can withdraw from any examination (even after the 3-day period has elapsed) with a valid reason. This includes illness, which you prove by means of a certificate at the examination office, but also justified exceptional cases. If you are prevented from taking the examination on the day of the examination for reasons for which you are not responsible, or if you are unable to take the examination, you must inform the Examinations Office immediately and in good time. The reasons must be credibly communicated to the Examinations Office (in the form of supporting documents, etc.). In this case, however, you are obligated to register for this examination for the following semester.

If you fall ill during an examination, you can terminate the examination attempt prematurely. In this case, you must immediately consult a medical officer at FAU. A leaflet and a list of medical officers can be found on the FAU website.

IMPORTANT: If you finish the exam regularly, you confirm that you were healthy and fit for the exam - a **retroactive** hardship application (also through certificates etc.) is generally not possible.

Printing in the CIP pool

As a student in the AT program, you have the possibility to print out documents for your studies, homework etc. in the CIP pool (eei.tf.fau.de/cip/en) of the Department of Electrical Engineering-Electronic-Information Technology. In the current state, printing is free of charge for all students of the Department EEI. If you have any questions concerning the CIP-Pool, please contact the following mail address: eei-cip@fau.de.

Information for Higher Semesters

Feedback

Re-registration serves to confirm enrollment for the next semester. Re-registration does not take place in person, but by transferring the semester fee. A sample transfer form is available via the internet portal "Campo".

The deadline for paying the semester fee is at the beginning of July for the respective following winter semester and at the beginning of February for the respective summer semester.

Failure to pay the semester fee by the deadline may result in exmatriculation!

Semester dates

The current dates for the coming semesters can be found at
www.fau.eu/education/study-organisation/semester-dates/

Change to FAU Erlangen-Nürnberg

During the course of study, students may transfer between German universities or other equivalent institutions of higher education. The bachelor's program is permeable until the end of the sixth semester.
If a change of university is envisaged, then more detailed information about the necessary steps should be obtained from the Examination Office and the Student Advisory Service.

Semesters already completed at other universities in the university-based Autonomy Technologies program cannot be deleted and therefore may play a role in the study time limit.
Upon enrollment, in addition to the general documentation, proof of exmatriculation from the previous university must be submitted.

Further details on crediting can be found in Section 6 of the General Degree Program and Examination Regulations for the Bachelor's and Master's degree programs at the Technical Faculty of the University of Erlangen-Nürnberg (ABMPO). When transferring to Erlangen for the 5th semester, it should be noted that any missing areas of the basic studies must be made up.

Admission to the Master's Program

The master's program Autonomy Technologies (AT) can be started at the University of Erlangen-Nürnberg both in the winter semester (WS) and in the summer semester (SS), since the cycle of courses is not necessarily based on the annual rhythm.

A completed bachelor's degree in Autonomy Technologies is required for admission to the master's program. A Bachelor of Science degree in a related subject may be admitted with conditions.

You must always apply for the Master's program. The Campo application request must be submitted with all uploaded required documents electronically by **15.07.** at the latest for the start of the **winter semester** and by **15.01.** at the latest for the start of the **summer semester.** You can reach the Master's Office at the following address: Halbmondstr. 6-8, 91054 Erlangen or e-mail: masterbuero@zuv.fau.de

Applications are always submitted via the online application portal Campo!

The list of required documents and applications can be found at:
www.fau.eu/education/application-and-enrolment/applying-for-masters-degree-programmes/

Bachelor students who are about to graduate and have earned at least 140 ECTS, apply with the current list of grades, even if not all modules have been successfully completed, as well as a printout about the registered and still open modules or examination achievements.

Admission to the master's program takes place via a qualification assessment procedure. Applicants with an Autonomy Technologie Bachelor's degree of FAU and a grade point average of 2.0 or better are admitted directly. Alternatively, if at least two of the modules 4, 5, 8, 10, 11, 12, 14, 16, or 17 according to Appendix 1 of the degree examination regulations have been passed with a module grade of 2.7 or better, admission may also be granted. All applicants with a subject related degree have to pass an online assessment test with at least a "good" grade.

Study Semester Abroad

A stay abroad during studies offers the opportunity to expand language skills as well as social and cultural competencies. For a study period abroad of one to two semesters, the following programs, among others, have proven to be particularly useful:

Erasmus -Program (Erasmus+ since 1.1.2021)

- Study visits to European partner universities
- Partners for EEI (as of 2023): Glasgow, Madrid, Valencia, San Sebastian, Prague, Pilsen, Rennes, Helsinki, Trondheim, Ankara, Riga, Irbit. Total approx. 35 seats/year.
- Recognition of study achievements with ECTS
- Organizational support for planning and implementation
- Waiver of foreign tuition fees
- Moderate financial support (mobility grant)
- Application: In each WS (mid-February) for the next WS and SS in the following year.

More info about Erasmus and list of partner universities:
www.fau.eu/fau/welcome-to-fau/internationalisation/erasmus/

GE4 (Global Education for European Engineers and Entrepreneurs)

- Study visits to universities in South America and Asia
- Waiver of tuition fees, assistance with entry formalities
- For students across the TechFak
- Application: In each case in the WS for the WS and SS in the following year
- Info: www.ge4.org

The planning of a stay abroad should begin one and a half years before the intended stay, since the entire study program must be coordinated accordingly and application deadlines with the foreign partners must be met. It makes sense to start a stay in the 5th semester of the bachelor's degree and in the master's degree at the earliest.

Information and advice:
Christian Carlowitz, Institute of Microwaves and Photonics (LHFT)
E-mail: christian.carlowitz@fau.de, Phone: 85 20772,
as well as with the program managers for the respective Erasmus partner university.

Study Organization

ECTS - European Credit Transfer System

The European Commission has developed the "European Credit Transfer System (ECTS)". This is intended to facilitate the recognition of study and examination credits. The Friedrich-Alexander University Erlangen-Nürnberg has introduced this system.
Two key features of ECTS are:

- ECTS credits are assigned to each course.
- An ECTS grading scale is introduced in addition to the local grading system.

ECTS points are intended to describe the amount of work required for the course. The workload for one semester should correspond to 30 ECTS points; one ECTS point requires approximately 30 full hours of work. To achieve the Bachelor's degree, 180 ECTS points are required. ECTS points are assigned to each course, the Bachelor's/Master's thesis and the industrial internship. These can be found in the appendix of the examination regulations for the bachelor's and master's degree program Autonomy Technologies.

Industrial Internship

For the master's degree program, practical work experience of at 300 hours in total is required. If possible, this internship should be operational, i.e. activities in the working environment of foremen and technicians, such as assembly, commissioning, maintenance and plant operation are expected. Completion of an internship prior to the start of studies is not required. There is also the possibility to apply for a semester of leave during the studies and to complete a longer voluntary internship at industry.

The Internship Office does not directly arrange internship positions. However, the Internship Office provides a list of internships on its homepage. Information about a proper procedure can be found in the internship guidelines, furthermore the Study Service Center EEI, Internship Office, is available for further information.
There is a notice posted at the Internship Office with current internship opportunities. The internship guidelines can be found at page 62 ff.
After completing a period of internship, the evidence should be submitted to the Internship Office for approval as soon as possible so that any evidence that is not appropriate can still be corrected without too much trouble.

Assessment of Examination Performance

Grading is regulated in Section18 of the General Examination Regulations.

1.0	Very good	An outstanding performance	Passed
1.3			
1.7	Good	A performance that is significantly above the average requirements	
2.0			
2.3			
2.7	Satisfactory	A performance that meets average requirements	
3.0			
3.3			
3.7	Sufficient	A performance that, despite its shortcomings, still meets the requirements	
4.0			
4.3	Insufficient	A performance that no longer meets the requirements due to significant defects	Failed
4.7			
5.0			

When overall grades are calculated, for example for the assessment of the preliminary examination (GOP) and the Bachelor's/Master's examination, the individual modules are included with the weight of the assigned ECTS points.

In the case of an overall grade, only one digit after the decimal point is considered; all other digits are deleted without rounding.

Overall score	Overall rating
≤1.5	Very good
1.6 ... 2.5	Good
2.6 ... 3.5	Satisfactory
3.6 ... 4.0	Sufficient

Those who complete the Bachelor's/Master's examination with an overall grade of 1.0 to 1.2 will receive the overall grade of

"passed with distinction".

Study Plan

The following explanations regarding the bachelor and master study show which courses are included in the Autonomy Technologies degree program. The study program is composed of modules that are assessed with ECTS credits. A module combines lectures, exercises or practical courses on a specific set of topics.

In the lectures, the necessary material and methodological knowledge is presented and largely processed receptively by the students. In other courses, such as exercises, tutorials and seminars, students should learn in smaller groups and under guidance to deepen the lecture material and to carry out scientific activity independently and critically.

It is recommended to supplement the acquired expertise with knowledge from other fields. Special reference should be made to the importance of sufficient expressive ability in foreign languages. In addition to knowledge of English, language skills in German are important, e.g. for carrying out an industrial internship or opening the door for a local career. The FAU Language Center offers a comprehensive range of German language courses: www.sz.fau.eu.

Bachelor Study

1st and 2nd semester - basic studies

The first two semesters are devoted to basic mathematics, programming, electrical engineering and machine learning.

The preliminary examination (Grundlagen- und Orientierungsprüfung; GOP) shall comprise modules worth 30 ECTS credits. The GOP shall have been passed when the student has passed the module Mathematics I and achieved a further 22.5 ECTS credits from the modules marked as "GOP" in the study plan (only valid if passed within the second attempt).

The distribution of the further modules over the two semesters and the duration of the examinations can be seen in the table below.

The "Introduction to MATLAB" programming block course is offered during the semester break. Registration and preliminary discussion are obligatory to attend.
The "Electrical Engineering Laboratory" is split into three parts across semester 2 – 4 with four experiments each (twelve experiments in total). ECTS credits are awarded after successful completion of all experiments.
Key qualifications can be chosen from the FAU's catalog of key qualifications in Campo. Recommended non-technical electives are "Buisness administration for engineers" or German language courses for international students. Elective modules can be taken in any semester; they are not bound to their formal classification in the curriculum.

Modules			Scope SWS			Semester				Proof of performance	
						1st sem.		2nd sem.		Examination	
No.	Name (module or submodule)		V	E	P	SWS	ECTS	SWS	ECTS	duration in minutes	GOP
1	Mathematics I	(GOP)	4	2		6	7.5			90	●
2	Mathematics II	(GOP)	4	2				6	7.5	90	●
4	Electrical Engineering I	(GOP)	4	2		6	7.5			90	●
5	Electrical Engineering II	(GOP)	4	2				6	7.5	90	●
6	Introduction to MATLAB				3	3	2.5			CA (LA)	
9	Electrical Engineering Laboratory				2			2	2.5	LA	
19	Algorithms, Programming, and Data Representation	(GOP)	4	2	2	8	10			120	●
20	System-level programming	(GOP)	2	2				4	5	90	●
24	Machine Learning for Engineers I		4					4	5	90	
29	Key qualifications I				2	2	2.5			EA see section 39 (5)	
32	Non-technical elective		2	2				4	5	EA see section 39 (5)	
			Sums SWS			25		24			
			Sums ECTS				30		30 – 32,5		

Legend:

- SWS: semester hours per week, i.e. class hours (45 min each) per week during the lecture period.
- V: lecture; E: exercise/tutorial/supplement; P: practical course,
- EA: examination achievement; CA: course achievement; LA: lab achievement

Preliminary examination (Grundlagen- und Orientierungsprüfung GOP)

Passing the preliminary examination:

The preliminary examination (Grundlagen- und Orientierungsprüfung; GOP) shall comprise modules worth 30 ECTS credits. The GOP shall have been passed when the student has passed the module Mathematics I and achieved a further 22.5 ECTS credits from the modules marked as "GOP" in the study plan.
As soon as a GOP-module is not passed within two attempts it does no longer count as a GOP-module!

General:

- One must register for each individual GOP examination in the semester to which the course offering of the examination subject counts.
- There is also **no** automatic exam registration for all remaining exams; each student is responsible for this.
- All examinations for mandatory modules are in written form. The duration of the examinations is specified in Appendix 1 of the Degree Program and Examination Regulations (see page 62)

Re-examination and deadlines of exams:

- Examinations that are part of the preliminary examination may be **repeated** only **once.**
- **Note:** If the student fails the exam, he or she will be **not** automatically registered for the re-examination. This has to be done by the student herself/himself.
- The preliminary examination must be completed within the second semester. This deadline may be exceeded by a maximum of 1 semester, otherwise the examination is considered as being failed.

3rd and 4th semester

The second third of the bachelor's program is intended to provide a broad base of knowledge of the various subject areas of Autonomy Technologies. The corresponding modules are listed in the following table.

Modules		Scope SWS			Semester				Proof of performance
No.	Name (module or submodule)	V	E	P	3rd sem.		4th sem.		Examination duration in minutes
					SWS	ECTS	SWS	ECTS	
3	Mathematics III	4	2		6	7.5			90
7	Introduction to Microwave Engineering	2	2		4	5			90
8	Mechatronic Components and Systems	2	2				4	5	90
9	Electrical Engineering Laboratory				2	2.5			LA
10	Electric Drives	2	2		4	5			90
12	Signal Theory	3	1		4	5			90
13	Stochastic Processes	3	1				4	5	90
15	Introduction to Communication Systems	3	1				4	5	90
16	Dynamical Systems and Control	2	2				4	5	90
21	Embedded Systems	2	2		4	5			90
23	Simulation of Autonomous Systems	2	2				4	5	EA see FPO INF
30	Key qualifications II						2	2.5	EA see section 39 (5)
		Sums SWS			24		24		
		Sums ECTS				30		30	

5th and 6th semester:

In the last both semesters, students have to complete their mandatory modules and select one specialization. In particular, two core modules, one specialization module, one seminar, and one laboratory must be selected from the catalog of the chosen specialization. The descriptions and catalogs of the specializations can be found on page 26 ff.

Modules		Scope SWS			Semester				Proof of performance
No.	Name (module or submodule)	V	E	P	5th sem.		6th sem.		Examination duration in minutes
					SWS	ECTS	SWS	ECTS	
11	Sensors	2	2		4	5			90
14	Digital Signal Processing	3	1		4	5			90
17	Machine Learning for Control Systems	2	2		4	5			90
18	Modeling of Control Systems	2	2		4	5			90
22	Numerics for Engineers I	2		2	4	5			60
25	Automation Laboratory			2			2	2.5	LA
Modules out of the catalog of areas of specialization									
26	Core modules (Kernmodule)				4	5	4	5	EA see section 40 (2)
27	Specialization module (Vertiefungsmodul) or Core module						4	5	EA see section 40 (2)
28	Seminar & Laboratory						4	5	SA + LA
Electives and bachelor thesis									
31	Technical elective						4	5	EA see section 39 (5)
33	Bachelor thesis with presentation							10	EA and presentation (30 min)
		Sums SWS			24		12		
		Sums ECTS				30		32.5	

- SWS: semester hours per week, i.e. class hours (45 min each) per week during the lecture period.
- V: lecture; E: exercise/tutorial/supplement; P: practical course,
- EA: examination achievement; CA: course achievement; LA: lab achievement; SA: seminar achievement

Comments:

- The 15 ECTS points for the key qualifications and elective modules (module 29-32) do not necessarily have to be taken in the specified semesters. These modules only have to be completed by the end of the Bachelor's program.
- You do not commit to the elective modules until you register for the exams. This makes it possible to "get a taste" of the courses first and then make a more informed decision.
- Modules from the courses offered by the Virtual University of Bavaria (vhb) can be credited in the elective area.

Bachelor thesis:

The Bachelor thesis has to be completed under the scientific supervision of a university teacher at a chair involved in the AT program (see below). The Bachelor thesis is intended to enable students to learn to solve problems relating to autonomy technologies independently.

As a rule, the Bachelor's thesis cannot be carried out at an institution outside the Departments of Electrical Engineering-Electronics-Information Technology, the Department of Computer Science or AIBE. Only the university lecturers working at the departments are authorized to assign the topics.

The bachelor thesis is assessed with 10 ECTS credits, including a final oral presentation of the thesis. The overall time effort for completing the Bachelor's thesis is specified with 300 hours. The start and end dates are agreed upon with the supervising university lecturer. The standard processing time is five months. An extension of the processing time by one month is granted in reasonable exceptional cases with the consent of the supervisor. The thesis is passed if it has been assessed with at least the grade "sufficient". An insufficient Bachelor thesis can be repeated once.

Admission to the Bachelor's thesis shall be governed by Section 27 (3)(2) ABMPO/TechFak and in Section 42 of the Degree and Subject Examination Regulations FPO. Admission to the Bachelor thesis is granted upon completion of 110 ECTS credits. According to Section 27, students must ensure that they receive a topic for the Bachelor thesis at the latest at the beginning of the last semester of the standard period of study.

Bachelor exam

Prerequisites for admission to module examinations:

The examinations of the modules that are not part of the preliminary examination (GOP) are part of the Bachelor's examination.

Attention: The student must register for all exams via Campo.

Re-examination of module exams:

Each failed examination, with the exception of the GOP and the Bachelor thesis, may be repeated three times.

Exam deadlines:

The standard deadline for taking the Bachelor's examination is the last semester of the standard period of study, i.e. the 6th semester. The standard deadline may be exceeded by a maximum of two semesters.

Master Study

The Master's program AT is conducted mostly in English language. The prerequisite for admission to AT is English by Abitur examination or evidence defined in the FPO.

Structure of the Master's program

Students in the master's program have to choose two areas of specializations out of:

- Human-System interfaces
- Networking & Collaboration
- Planning & Control
- Sensing & Perception

There is a catalog for each specialization. These each consist of

- 4 core modules (every student has to obtain 10 ECTS in this module category) and further
- mandatory elective modules (every student has to obtain 20 ECTS in this module category)

The core and mandatory elective modules are supplemented by

- elective subjects (15 ECTS)
- a seminar (2.5 ECTS)
- a laboratory (2.5 ECTS)
- a team project or engineering industrial internship (10 ECTS)
- a master thesis with presentation (30 ECTS) and

Elective subjects

All core modules and mandatory modules can be also taken also as elective subjects. Note: a module can be considered only once for the required 120 ECTS. Recommended non-technical elective subjects are “Innovation and Leadership” or German language courses for international students. Elective subjects can be taken in any semester; they are not bound to their formal classification in the curriculum.
Important: Bachelor’s modules (see page 62) cannot be taken as elective subjects.

Seminar and laboratory module

One seminar and one laboratory course worth in total 5 ECTS should be chosen from the range of modules offered for the two selected specializations.

Team project or engineering industrial internship

The qualification goal of the team project is to enable students to learn the practice of scientific work in research. Upon completion of the team project, they will be able to independently conduct a literature research and to classify and analyze literature sources. Furthermore students learn to work in a team to solve the task assigned to them from the field of autonomy technologies within a given period of time with the help of scientific methods and develop

suitable solutions and concepts. The focus of the research work can be experimental, theoretical or constructive in nature. The team project has to be conducted by a team of 4-5 students. Topics are announced by the chairs and institutes involved in Autonomy Technologies. Combinations of different emphases are permitted. The workload is 300 hours. Also required is a written paper and the giving of a presentation. However, it can also be a pure programming work. The scope for both variants is a 10-page report and a 30-minute presentation (conducted in a team not by every single student). The standard processing time is five months. The team project does not require a registration at the examination office. After the completion the result (passed or not passed) and the title have to be announced to the examination office by the supervisor.

Alternatively to the team project an industrial internship may be completed. This is to be carried out in accordance with the guideline for the practical training in the master's degree program Autonomy Technologies and must be recognized by the Internship Office Autonomy Technologies.

Master thesis:

The Master thesis has to be completed under the scientific supervision of a university teacher at a chair involved in the AT program (see below). The Master thesis is intended to enable students to learn to solve problems relating to autonomy technologies independently.

As a rule, the Master thesis cannot be carried out at an institution outside the Departments of Electrical Engineering-Electronics-Information Technology, the Department of Computer Science or AIBE. Only the university lecturers working at the departments are authorized to assign the topics. If students are interested to do a thesis at industry or at a university abroad they have to find a supervisor at the mentioned departments in advance.

The Master thesis is assessed with 30 ECTS credits, including a final oral presentation (30 minutes) of the thesis. The overall time effort for completing the Master thesis is specified with 900 hours. The start and end dates are agreed upon with the supervising university lecturer and has to be announced by him/her to the examination office. The standard processing time is six months. An extension of the processing time by three month is granted in reasonable exceptional cases with the consent of the supervising university lecturer and the consent of the examination board. The thesis is passed if it has been assessed with at least the grade "sufficient". An insufficient Master thesis can be repeated once.

Admission to the Master thesis shall be governed by Section 32 ABMPO/TechFak and in Section 50 of the Degree and Subject Examination Regulations FPO. Admission to the Master thesis is granted upon completion of 80 ECTS credits. According to Section 32, students must ensure that they receive a topic for the Master thesis at the latest at the beginning of the last semester of the standard period of study.
Important information: https://www.at.study.fau.eu/students/final-thesis/

Exam deadlines:

The standard deadline for taking the Master's examination is the last semester of the standard period of study, i.e. the 4th semester. The standard deadline may be exceeded by a maximum of two semesters.

Study plan Master's Autonomy Technologies

Modules		Semester breakdown								
No.		1st		2nd.		3rd		4th		
		SWS	ECTS	SWS	ECTS	SWS	ECTS	SWS	ECTS	
1	Specialization I: Core modules	4	5	4	5					see 46 (2)
2	Specialization I: Specialization modules	4	5	4	5	8	10			see 46 (2)
3	Specialization II: Core modules	4	5	4	5					see 46 (2)
4	Specialization II: Specialization modules	4	5	4	5	8	10			see 46 (2)
5	Elective subjects	8	10	4	5					see 47 (2)
6	Seminar & laboratory			4	5					see 48
7	Team project or industrial internship						10			see 49
8	Master thesis with presentation								30	
	Sums SWS	24		24		16				
	Sums ECTS		30		30		30		30	

Note: The distributions of ECTS within each semester is flexible and can be decided by the students. At least 25-30 ECTS should be completed within one semester.

Study Specializations:

Human-System interfaces

Human-System interfaces are key for the efficient operation of autonomous systems since irrespective of the degree of autonomy, the overarching goals of the systems need to be determined and communicated by human beings. To this end, not only the systems themselves but also the interacting human(s) have to be understood. This requires an approach leveraging on technical as well as human sciences.

The specialization conveys in-depth knowledge of human-system interfaces as well as their human-centered development. Therefore, it combines content from engineering and computer science with such from biomechanics, psychology, and cognitive science. Knowledge about human perception and information processing enables predicting and detecting human behavior while methods for modeling, design, and control are used to optimize the technical system. Combining both areas while considering human factors, enables the design of intuitive and efficient interfaces that promote a fruitful co-adaptation between human users and (learning) systems. Teaching in the modules of this area of specialization covers:

- Modeling, design, and control of mechatronic and robotic systems that interact with human users. To address the complexity of human-system interaction, this comprises advanced methods (e.g., (compliant) robot control and learning algorithms for intent detection).
- Analysis and design of human-system interfaces and human-system interaction spanning different classes of systems: computers, machines, robots, etc. Taking an interdisciplinary approach, physical as well as cognitive interaction are tackled.
- Data processing for human-system interaction (e. g., image, video, audio, speech processing etc.). This comprises acquiring human data with sensors that are either close to humans or even worn by them.
- Applications in various technical domains ranging from human-controlled (e.g., robotic prostheses) to semi-autonomous (e.g., robotic guidance in surgery) and fully autonomous systems (e.g., autonomous driving).

Specialization Human-System interfaces

Responsible: Prof. Dr.-Ing. Philipp Beckerle

	Chair/ Dep	ECTS	SHW L	SHW S	Sem	Exam mode written (min.)	Exam mode oral
Core modules							
Human-centered Mechatronics and Robotics	ASM	5	2	2	S	90	
Robot Mechanisms and User Interfaces	ASM	5	2	2	W	90	
Human Computer Interaction	AIBE	5	3	1	S	90	
Intent Detection and Feedback	AIBE	5	2	2	S	60	
Specialization modules							
AI in medical robotics	AIBE	5	2	2	W	60	
Robotics in Surgery and Diagnostics	AIBE	5	2	2	S	variable	
Gait Analysis and Simulation+	ASM	5	2	2	W		
Body Area Communications	LITES	2.5	2	0	W		x
Cognitive Neuroscience for AI Developers	INF5	5	2	2	W+S	variable	
Human-Robot Co-Adaptation	AIBE	5	2	2	W	60	
Image and Video Compression	LMS	5	3	1	S	90	
Image, Video and Multidimensional Signal Processing	LMS	5	3	1	W	90	
Rehabilitation and Assistive Robotics	AIBE	5	2	2	S	variable	
Surgical Technology Innovation	AIBE	5	2	2	W		
Speech Enhancement	AL	2.5	2	0	W	variable	
Laboratory							
Human-Robot Interaction	ASM	2.5	2	0	W	LA	
Seminars							
Autonomous Systems and Mechatronics	ASM	2.5	2	0	W+S	SA	
The why and how of gait simulations (HGS)	ASM	2.5	2	0	W	SA	
Human-Robot Interaction	ASM	2.5	2	0	W	SA	
Machine Learning in Movement Analysis	ASM	5	3	0	W+S	SA	

Networking & Collaboration

Autonomous systems embedded in complex configurations and dynamic environments, as well as multi-collaborative and AI-driven robotic frameworks necessitate smart and advanced communication systems that enable effective and trustworthy information exchanges along with secure and reliable interactions and coordination. Networking and collaboration endow autonomy technologies and autonomous systems with a framework of fundamental functionalities which ensure communications and cooperation among autonomous agents and/or autonomous agents and humans.

The specialization provides in-depth knowledge of wired and wireless digital transmission systems, advanced communication protocols and architectures that support mobility, and fundamental analytical tools for learning complex and dynamic environments, designing and implementing centralized and distributed systems, and analysing their performance. Additionally, the specialization introduces students to optimal and practical techniques for information processing, resource allocation, auto-organization in distributed setting, and robust system design based on partial and inaccurate information. More specifically, the following topics are taught in this specialization area:

- Techniques for design and analysis of communication systems including both fundamentals of information and signal processing for simple autonomous systems based on point-to-point communications and advanced complex information and communication approaches for multi-collaborative autonomous systems.
- Communication protocols and architectures spanning from thoroughly organized wired and wireless networks to auto-organizing dynamic systems with distributed intelligence and coordination capabilities.
- Fundamentals of machine learning and deep learning along with advanced centralized and distributed learning techniques for communication and collaboration systems. In particular, machine learning and deep learning techniques are effectively applied to model transmission media in complex and evolving configurations, to design near-optimal communication systems in challenging transmission environments, and to reduce computational complexity while enhancing system robustness.
- Analytical tools for optimal and sub-optimal system design and resource sharing in cooperative and competitive environments, such as centralized and distributed optimization and game theory. Principles of self-organization for multi-collaborative systems capable of independent coordination such as cyber-physical systems. Robust design techniques capable to exploit possible trade-offs between power/energy consumption, accuracy, performance, and/or cost such as approximate computing.

Specialization Networking & Collaboration

Responsible: Prof. Dr. Laura Cottatellucci

	Chair/ Dep	ECTS	SWS L	SWS S	Sem	Exam mode written (min.)	Exam mode oral
Core modules							
Digital Communications	IDC	5	3	1	W	90	
Information Theory & Coding	IDC	5	3	1	W	120	
MIMO Communication Systems	IDC	5	3	1	S	90	
Machine Learning in Communications	IDC	5	3.5	0.5	W		x
Specialization modules							
Advanced Communication Networks	IDC	5	3	1	S		x
Approximate Computing	INF12	5	2	2	S		x
Channel Coding on Graphs	IDC	5	3	1	S		x
Communications Systems Design	LITES	5	2	2	W		x
Convex Optimization in Communications and Signal Processing	IDC	5	3	1	W	90	
Cyber-Physical Systems	INF12	5	2	2	W+S	90	
Image and Video Compression	LMS	5	3	1	S	variable	
Mobile Communications	IDC	5	3	1	S	90	
Multiuser Information & Communications Theory	IDC	5	3	1	W		x
Random Matrices in Communications & Signal Processing	IDC	5	3	1	W		x
Transmission and Detection for Advanced Mobile Communications	IDC	2.5	2		S		x
5G/6G Next Generation Mobile Communication Systems	IDC	2.5	2		S		x
Laboratories							
Digital Communications	IDC	2.5	2	0	W+S	LA	
Digital Signal Processing	LMS	2.5	2	0	W	LA	
Image and Video Compression	LMS	2.5	2	0	S	LA	
Mobile Communications	IDC	2.5	2	0	S	LA	
Machine Learning in Signal Processing	LMS	2.5	2	0	S	LA	
Communications Systems Design	LITES	2.5	2	2	W	LA	
Seminars							
Smart City: Technologies and Systems	LITES	2.5	2	0	W	SA	
Joint communications and sensing in wireless systems	LITES	2.5	2	0	S	SA	

Planning & Control

Planning and control focuses on making dynamic decisions for autonomous systems while accounting for their ego and environmental situations. Roughly speaking, planning concerns the computation of necessary actions to reach a certain goal, whereas control stabilizes the autonomous system such as a drone or an autonomous racing car, compensates for potential disturbances and keeps the system on the planned path. Planning and control are therefore essential technologies to operate autonomous systems.

The specialization conveys the essentials and state-of-the-art concepts for planning and control of autonomous systems ranging from advanced control and optimization concepts over fundamental and advanced topics in robotics up to artificial intelligence and machine learning concepts for autonomy. Using a solid mathematical basis allows to develop planning and control methods independent of the physical domain of the autonomous system and the specific application. In particular, the modules of this area of specialization cover:

- Advanced nonlinear control and optimization concepts for an optimal and embedded control of autonomous systems and predictive planning under constraints such as security margins or obstacles
- Basics and advanced topics in robotics, ranging from kinematics and dynamics over trajectory and path planning up to software frameworks, for instance, for mobile robots and manipulators and general robotic applications
- Artificial intelligence and machine learning methods including, for instance, reinforcement learning and deep learning, to learn the mathematical model of an autonomous system and its environment or to directly learn actions from repetition and experience
- Lab courses and seminars to gain experience with applying planning and control methods to autonomous systems, in particular in mechatronic and robotic applications, and to learn about the cutting-edge research in this field.

Specialization Planning & Control

Responsible: Prof. Dr.-Ing. Knut Graichen

	Chair/ Dep	ECTS	SWS L	SWS S	Sem	Exam mode written (min.)	Exam mode oral
Core modules							
Robotics I	AC	5	2	2	S	90	
Nonlinear Control Systems	AC	5	3	1	S	90	
Numerical optimization and model predictive control	AC	5	3	1	S	90	
Introduction to Deep Learning	LMS	5	2	2	W	90	
Specialization modules							
Regelungstechnik B	AC	5	2	2	W	90	
Robotics II	AC	5	2	2	W	90	
Digitale Regelung	AC	5	2	2	S	variable	
Schätzverfahren in der Regelungstechnik	AC	5	2	2	S	90	
Ereignisdiskrete Systeme	AC	5	2	2	S	variable	
Statistical Signal Processing	LMS	5	3	1	W	90	
Machine Learning in Signal Processing	LMS	5	3	1	W	90	
Advanced Topics in Deep Learning	LMS	5	3	1	S		
Pattern Analysis	INF5	5	3	1	S	variable	
Pattern Recognition	INF5	5	3	1	W	90	
Swarm Intelligence	INF12	5	2	2	S	90	
Reinforcement Learning	AIBE	5	2	2	S	variable	
Grundlagen der Robotik	FAPS	5	2	2	S	120	
Robotics Frameworks	FAPS	5	2	2	W	90	
Verteilte Systeme	INF5	5	2	2	S	90	
Laboratories							
Automatic Control I	AC	2.5	2	0	W+S	LA	
Automatic Control II	AC	2.5	2	0	W	LA	
Legged Locomotion of Robots	ASM	2.5	2	0	S	LA	
Machine Learning in Signal Processing	LMS	2.5	2	0	S	LA	
Seminars							
Modern Control Methods	AC	2.5	2	0	W+S	SA	
Mobile Robotics	AC	2.5	2	0	W	SA	
Legged Locomotion of Robots	ASM	2.5	2	0	S	SA	
Selected Topics in Machine Learning	LMS	2.5	2	0	S	SA	

Sensing & Perception

Through sensing and perception, autonomous systems obtain information about the environment, gain state awareness, and use it for various purposes such as navigation, control, or interaction with other agents. Sensing is performed with variety of sensors, including image, lidar, radar or wireless sensor systems. In addition to the sensor, it is often necessary to develop dedicated hardware and software for processing the acquired signals. Further signal processing is part of the perception. The perception deals with tasks such as scene understanding, object localisation and tracking, and recognition among others. Most of these tasks are based on machine learning methods, with deep neural networks being the main contributors.

The specialization focuses on approaches for obtaining information about the agent's own state and for observing and understanding the environment and other agents (humans and systems) acting in it. It provides knowledge on the design and implementation of appropriate sensor technologies such as wireless locating technologies as GPS, or camera, radar, ultrasound or lidar sensors as used in modern vehicles and autonomous agents in general. It also focuses on signal processing algorithms and machine learning techniques for the analysis and interpretation of the acquired data. In particular, the following topics are taught:

- Radar, RFID and Wireless Sensor Systems: one can learn the operation and design principles, hardware and signal processing for sensors such as radar, RFID, wireless sensor systems and positioning systems.
- Statistical Signal Processing: This topic aims to provide the fundamentals of signal processing, including time and frequency domain processing, estimation theory, linear signal models, non-parametric models and signal estimation. Signal filtering is extensively covered.
- Image, Video and Multidimensional Signal Processing: The goal is to learn the basics of image and video signal processing, including multidimensional signals and systems. Also feature extraction from image and video signals are part of the topic, including motion estimation, segmentation, and image matching.
- Machine Learning in Signal Processing: one can learn the fundamentals of machine learning, including theory and applications. Processing different types of data and signals with machine learning algorithms will also be discussed.

Specialization Sensing & Perception

Responsible: Prof. Dr. Vasileios Belagiannis

	Chair/ Dep	ECTS	SWS L	SWS S	Sem	Exam mode written (min.)	Exam mode oral
Core modules							
Radar, RFID and Wireless Sensor Systems	LHFT	5	2	2	S	90	
Statistical Signal Processing	LMS	5	3	1	W	90	
Image, Video, and Multidimensional Signal Processing	LMS	5	2	2	W	90	
Machine Learning in Signal Processing	LMS	5	3	1	W	90	
Specialization modules							
Image and Video Compression	LMS	5	3	1	S	variable	
Perception in Robotics	LMS	5	3	1	S		
Transformations in Signal Processing	LMS	2.5	2	0	S		x
Computational Visual Perception	INF15	7.5	4	2	W	60	
Speech and Language Processing	INF15	5	2	2	S	90	
Computer Vision	INF15	5	2	2	S		
Linear and non-linear fibre optics	LHFT	5	3	1	S	variable	
Radar Signal Processing	LHFT	5	2	2	W		x
Advanced Optical Communication Systems	LHFT	5	2	2	W		x
Waveguides, optical fibres and photonic crystal fibres	LHFT	5	2	2	W		x
Labratories							
Image and Video Compression	LMS	2.5	2	0	S	LA	
Image and Video Signal Processing on Embedded Systems	LMS	2.5	2	0	S	LA	
Digital Signal Processing	LMS	2.5	2	0	W	LA	
Machine Learning in Signal Processing	LMS	2.5	2	0	S	LA	
Machine Learning and Systems	LMS	2.5	2	0	W	LA	
Laborpraktikum Sensorik	AC	2.5	2	0	S	LA	
Seminars							
Wireless, Radar and Microwave Techniques	LHFT	2.5	2	0		SA	
Selected Topics of Multimedia Communications and Signal Processing	LMS	2.5	2	0	W+S	SA	
Selected Chapters in Navigation and Identification	LIKE	2.5	2	0	W+S	SA	
Selected Topics in Machine Learning	LMS	2.5	2	0	S	SA	

Addresses and Contact Persons

Internet

- University homepage:
  www.fau.eu
- Homepage of the study program AT:
  www.at.study.fau.eu
- General information about the study
  University homepage→ People→ Students ...

Advice Centers

Study Service Center EEI

Cauerstraße 7, 91058 Erlangen, Room 1.034
Phone: 85 71178
E-mail: study-at@fau.de
Study coordinator: Joanna Kudanowska

Office hours at FAU: Mondays and Fridays 8 -12 h and 13-15 h
Office hours online: Tuesdays – Thursdays 8 -12 h and 13-15 h by phone, e-mail or zoom.

Internship Office EEI

Cauerstraße 7, 91058 Erlangen, Room 1.033
Phone: 85 27159
E-mail: eei-praktikumsamt-at@fau.de
Contact person: Alexandra Winkler

Student Advice and Career Service (ZSB)

Schloßplatz 3/ Halbmondstr. 6, Phone: 85 23333 and 85 24444
P.O. Box 3520, 91023 Erlangen
E-mail: zsb-tech@fau.de
Brief information, distribution of information material and making appointments for detailed individual consultations.
This central point of contact for all questions concerning studies provides advice in particular on study opportunities at the university, in the event of difficulties during studies, if a change of subject or dropping out of studies is being considered. If necessary, those seeking advice are referred to the relevant offices.

Student Administration/Student Records Office

Halbmondstraße 6-8 (near Schloßplatz), Phone: 85 24078, 85 24080
91054 Erlangen
E-mail: studentrecordsoffice@fau.de
Mon - Fri 8.30 - 12.00

Enrollment and re-registration take place at the Student Office. The Student Office is also responsible for leave of absence and exmatriculation.

Admission Office

Halbmondstraße 6 (near Schloßplatz), Phone: 85 24076, 85 24079
P.O. Box 3520, 91023 Erlangen
Mon-Fri 8.30-12.00

Student Services - BAföG

Office for the Promotion of Education, Hofmannstraße 27, 91052 Erlangen, Phone: 8002900
www.Studierendenwerk.fau.de/
The Studierendenwerk administers the General Student Grant in accordance with the Federal Training Assistance Act (BAföG).
Application forms are also available at the **Studierendenwerk**, Langemarckplatz 4, Room 021.
Person in charge for AT at TechFak is Prof. Thomas Moor: Thomas.moor@fau.de

Studierendenwerk - Housing

Student Housing Department, Henkestraße 38a, 91054 Erlangen,
Phone: 8002-23 or 8002-24
www.werkswelt.de/index.php?id=wohnen&setlang=en
Forms for application for admission to a **residence hall of** the Studierendenwerk can also be requested in writing.
The homes "Ratiborer Str. 2 and 4", "Hartmannstr. 125/127/ 129" and "Erwin-Rommel-Str. 51-59" are closest to the site of the Technical Faculty.

Private Accommodation

Langemarckplatz 4, 91054 Erlangen, Room 011, Phone: 80020
www.werkswelt.de/index.php?id=privatzimmervermittlung
The mediation of private rooms is possible only in person.

Other departments of the Studierendenwerk are responsible for other **social concerns of** the students, e.g. for legal counseling, for psychological-psychotherapeutic counseling.

International Office

Schloßplatz 4,
Phone: 85 24800
E-mail: welcome-students@fau.de
P.O. Box 3520,
Visitor address: Helmstr.1, 91023 Erlangen

Scholarship Office of the University

Halbmondstraße 6 (near Schloßplatz), Phone: 85 24075
P.O. Box 3520, 91023 Erlangen

Faculty of Engineering

Dean's Office of the Faculty of Engineering

Martensstr. 5a, 91058 Erlangen, Room 1.02, Phone: 85 27295

The Dean conducts the day-to-day business of the Faculty of Engineering. She/he is the highest representative of the faculty.
The doctoral regulations of the Faculty of Engineering are available in the Dean's Office.

Examination Office of the Faculty of Engineering

Halbmondstraße 6 (near Schloßplatz), Room 1.041, Phone: 85 71386
Tue - Thu 8.30 - 12.00 am
www.fau.eu/education/advice-and-services/examination-offices/examinations-office-faculty-of-engineering/
The Examinations Office can be contacted for all questions concerning examinations, e.g. registration for examinations, examination regulations, applications for credit for other academic achievements, applications to the Examination Board, extension of study time.
Contact person for AT is whitney.reed@fau.de.

Library

Technical and Scientific Branch Library, Erwin-Rommel-Str. 60,
91058 Erlangen, Phone: 85 27468 (lending) or 85 27600 (information)

Semester and lecture-free period:

Mon - Fri	8:00 - 24:00
Sat, Sun	10:00 - 24:00

Issuance of user cards:

Mon - Fri	8:00 - 19:00
Sat	10:00 - 14:00

There are photocopying machines in the branch library and in the passageway to the lecture hall building. At the beginning of the semester, introductions to the use of the library take place. In addition to the central branch library, there are also libraries at the individual chairs of electrical engineering, electronics and information technology. These are reference libraries, i.e. the books cannot be borrowed there.

Department of Electrical Engineering

EEI Office

Cauerstraße 7, 91058 Erlangen, Room 01.032
E-mail: info@eei.fau.de
Manager: Dr.-Ing. Markus Jonscher
Internship Office: Alexandra Winkler

Study Service Center EEI

Cauerstraße 7, 91058 Erlangen, Room 01.034
Phone: 85 71178
E-mail: study-at@fau.de
Student coordinator: Joanna Kudanowska
Monday to Friday 9-12 h and 13-16 h. Please make appointments for detailed study counseling by phone/e-mail.

Internship Office

The Internship Office is responsible for the recognition of industrial practice and related issues. In order to recognize a completed internship period, an "Application for Recognition of Industrial Internship" must be completed. The form for this is provided on the Internet. The recognition of an internship is done via the **online portal:** praktikumsamt.eei.tf.fau.de**.** All documents for the respective internship section must be uploaded there. The documents will only be processed if the status in the portal is "Complete".

Office of the Department of Electrical Engineering-Electronics-Information Technology
Cauerstraße 7, 91058 Erlangen, Room 01.033
Phone: 85 28351
E-mail: info@praktikumsamt-at@fau.de
Office hours: see notice at the EEI office or on the Internet at
https://www.eei.tf.fau.de/en/education/internship-office/

EEI CIP Pool

The CIP-Pool of the Department of Electrical Engineering (computer room for students of Electrical Engineering-Electronics-Information Technology, room 0.157, Cauerstrasse 9, ground floor) offers internet access and the possibility to use computers. Students receive access to the CIP pool of the Department EEI with the FAU card.
Contact: Andreas Rex, Cauerstr.7, 91058 Erlangen, Room: 01.039, Phone: 85 61048, E-Mail: eei-cip@fau.de

BaföG

Professor Thomas Moor is responsible for BaföG certificates for the AT program; Cauerstraße 7, 91058 Erlangen, Phone: 85 27129, E-mail: thomas.moor@fau.de

Department of Computer Science

INF Office

Martensstr. 3 (Wolfgang-Händler-Hochhaus), 91058 Erlangen, Room 02.155
Phone: 85 28807; E-mail: sekretariat@informatik.uni-erlangen.de
Head: Dr. Christian Brosch
Secretariat: Isabella Frieser

Computer Science CIP Pool

The same applies to the computer science CIP pools in the computer science tower. The CIP cluster consists of more than 150 workstations of different architectures and is available for teaching purposes of the Department of Computer Science. Each student can obtain access for the duration of his or her studies. Contact: Room 00.157 (server room on the first floor), E-mail: problems@cip.informatik.fau.de

Department Artificial Intelligence in Biomedical Engineering

AIBE Office

Werner-von-Siemens-Str. 61, 91052 Erlangen, Room 03.31
Phone: 85 70674; E-mail: aibe-administration@fau.de
Head: Dr. Marlene Reuschel

Student Council AT

Students from all degree programs form the "Fachschaftsinitiative zur Wiedereinführung der Verfassten Studierendenschaft" (FSI for short). They organize introductory events for first-year students, host parties, and collect past exams, among other activities. They also send student representatives to the higher boards of the university. The FSI plays a key role in maintaining contact with professors in your department, fostering a positive study atmosphere and assuring your feedback is heard. In short, this group represents you in the higher boards of the university and ensures you have a great time during your studies.

For any questions or concerns, you can reach the FSI at fsi-at@fau.de. You can also contact us through the communication channels introduced during your introduction events.

IAESTE

International Association for the Exchange of Students for Technical Experience

Cauerstraße 4, 91058 Erlangen, Room 1.178
Phone: 85 28761, E-mail: lc@iaeste-erlangen.de
(c/o Chair of Electrical Power Supply)
http://www.iaeste-erlangen.de

The local committee of IAESTE arranges internships abroad and supervises foreign interns in Erlangen and the region.

The Involved Chairs of the Departments

The Autonomy Technologies program is jointly designed by the Department of Electrical Engineering (EEI), the Department of Computer Science and the Department Artificial Intelligence in Biomedical Engineering (AIBE).

The departments consist of 16 (EEI) or 15 (Computer Science) chairs, some of which are involved in the required courses of the AT program. These chairs are briefly presented here. The Department AIBE is not divided into individual chairs.

In the following, the university professors are listed as well as some areas in which the chairs are active in research. Further information can be found on the websites of the chairs. To find out about the latest topics for student research projects and theses, please visit the websites or special notice boards of the individual chairs. Theses can be supervised by the listed university professors.

Department of Electrical Engineering

Chair of Autonomous Systems and Mechatronics (ASM)

Prof. Dr.-Ing. P. Beckerle
Prof. Dr. Anne Koelewijn

Paul-Gordan-Str. 3/5, 91052 Erlangen,

Phone: 85 23132, E-Mail: asm-info@fau.de

Autonomous and mechatronic systems are entering our daily lives and are increasingly interacting with us. The mission at ASM is to research human-centered mechatronics and robotics seeking solutions that provide the desired performance along with user-friendly interaction characteristics. ASM puts emphasis on wearable systems such as prostheses or exoskeletons, cognitive systems such as collaborative or humanoid robots, and generally on tasks with close human-robot interaction. In addition to the study of mechatronic components and controls, such scenarios require the consideration of human factors to meet user requirements and achieve synergetic human-machine interfaces and interactions.

Chair of Automatic Control

Prof. Dr.-Ing. K. Graichen
Prof. Dr.-Ing. T. Moor

Cauerstraße 7, 91058 Erlangen,
Phone: 85 27130, E-Mail: lrt@fau.de

The research activities of the Chair of Automatic Control (AC) focus on the analysis, modeling, control, and optimization of dynamical systems with applications ranging from mechatronics and robotics to process control and energy related applications. AC has a long-time experience with bringing research into practice and maintain close and successful cooperations with industrial partners. AC is responsible for the education in control engineering within the bachelor and master programs at FAU and therefore cross the bridge towards the other departments of the Faculty of Engineering.

LIKE Chair of Information Technology with the Focus on Communication Electronics

Prof. Dr.-Ing. A. Heuberger
Prof. Dr.-Ing. J. Robert

Am Wolfsmantel 33, 91058 Erlangen,
Phone: 85 25101, E-Mail: like-info@fau.de

Telematics with the three topics telemetry, satellite communication and navigation form the following focal points at the Chair of Information Technology with the Focus on Communication Electronics (LIKE):

- Telemetry for long ranges at lowest power consumption
- Miniaturized and energy-saving sensor nodes for telemetry (IoT, Industry 4.0, etc.)
- Localization and optimization of RFID systems
- Embedded systems for radiolocation and telemetry
- Navigation inside and outside buildings using GPS/Galileo
- Radio detection (e.g., for movement analysis of bats)
- Autonomous driving and robotics
- Circuits and systems for space travel

idc Chair for Digital Transmission

Prof. Dr.-Ing. R. Schober
Prof. Dr.-Ing. R. Müller
apl. Prof. Dr.-Ing. W. Gerstacker
Prof. Dr. techn. Laura Cottatellucci

Cauerstraße 7, 91058 Erlangen, Secretary's office: Room 05.035
Phone: 85 27161, E-mail: gabriele.melzer@fau.de

- Wired and wireless message transmission
- Information theory
- Smart grid communication
- Molecular communication
- Optimization and resource allocation for radio networks
- Cognitive radio
- Sensor networks
- Communication systems: 5G, 6G, LTE-A, LTE, UMTS, HSPA, GSM/EDGE, WLAN, WiMAX, TETRA
- Modulation and coding methods
- Design high efficiency receiver for digital transmission
- Interference suppression and interference management
- Multi-antenna transmission systems ("MIMO")
- Wireless power transmission
- Relay-based transmission methods
- Secure data transmission
- Energy efficient message transmission

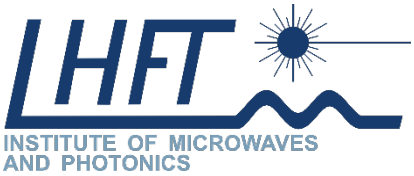
Chair of Multimedia Communication and Signal Processing

Prof. Dr.-Ing. A. Kaup
Prof. Dr. V. Belagiannis
Prof. Dr.-Ing. S. Schlecht
PD Dr.-Ing. habil. Jürgen Seiler

Cauerstraße 7, 91058 Erlangen, Secretary's office: Room 06.032
Phone: 85 27101, E-mail: walburga.summersammer@fau.de

- Machine learning in signal processing
- Hardware-aware machine learning
- Reliability, robustness, and resilience in deep learning
- Image and video signal processing
- Video compression
- Video signal analysis and enhancement
- Image Communication Systems
- 3D and multi-camera systems
- Voice and audio communication systems
- Acoustic scene analysis
- Speech signal enhancement and robust speech recognition
- Wave field analysis and synthesis

- Sound synthesis
- Multidimensional and multichannel systems
- Statistical signal processing and adaptive systems
- Signal analysis and measurement technology
- Multirate systems and filter banks
- Transformations, especially wavelet transformations



(German: Lehrstuhl für Hochfrequenztechnik)

Prof. Dr.-Ing. Martin Vossiek
Prof. Dr.-Ing. Bernhard Schmauß
Prof. Dr.-Ing. Klaus Helmreich
Prof. Dr.-Ing. Gerhard Krieger

Cauerstraße 9, 91058 Erlangen, Sekretariat: Raum 06.230
Phone: 85-27214, E-Mail: lhft-info@fau.de
http://www.lhft.eei.fau.de

Since its inception over fifty years ago at the University of Erlangen, Germany, the Institute of Microwaves and Photonics (LHFT) has become a worldclass center for microwave research and scholarship.
Electrical engineering as applied to microwaves und millimeter waves through the Terahertz (THz) range and on up to photonics / laser systems are at the focus of teaching and research at LHFT. On the hardware and systems side, the academic staff at LHFT deal with the entire spectrum from component level, through submodules up to fully integrated systems.
The research projects at LHFT are at the heart of many new developments and applications in the fields of medicine, transportation and traffic, residential systems and commercial enterprises. Imaging radar, broadband networks, wireless tracking systems, wireless sensors, RFID, AI-based sensing and photonics systems as developed at LHFT, are technologies we all come across in our daily lives. They are critical in medical diagnostics and therapies; they make the roads safer; they are used in smart materials and structures; they help navigate driverless vehicles; they are key to optimizing processes and to saving resources, time and energy.
Research activities cover almost the entire spectrum of wave-based sensors and applications:
• Design, simulation, realization and test of microwave circuits, antennas and entire RF systems
• Photonics and optical data transmission links
• System technologies, embedded systems and low-level signal processing and algorithms for microwave and photonic systems

• Radar and microwave systems, imaging radar and navigation
• Radar in automotive, robotics, autonomus systems, subsurface sensing, material characterization, remote sensing and space applications
• Radio communications: wireless 100 Gb/s, massive MIMO, cross-linked systems
• Medical applications: Microwave imaging systems, RF components for MRI, photonics in ophthalmology
• RF localization, RFID, wireless sensors, telemetry, wireless energy harvesting sensors, wireless energy transfer
• Electromagnetic fields, signal integrity for high-speed electronics
• Fiber based components and systems: Fiber-Bragg-Gratings, non-lineare fiber optics, fiber optical sensors, fiber lasers
• Design, simulation and additive manufacturing of RF components and antennas, AiP

Chair of Technical Electronics

Prof. Norman Franchi
Prof. Dr.-Ing. G. Fischer

Cauerstr. 9, 91058 Erlangen, Secretary's office: Room 04.228
Phone: 85 27195, E-mail: lites-verwaltung@fau.de

The chair is dedicated to teaching and research in the development, construction, and testing of electronic circuits and systems for the transmission, transfer, storage, and evaluation of analog and digital data in the form of electrical, electromagnetic, and optical signals for various applications, as well as the design and optimization of resilient electrical communication systems.
The chair is thus active in highly relevant fields of application such as information and communication technology, production technology, automotive and transport technology, logistics, energy technology, as well as the areas of health, infrastructure, resilience, and security. In addition, new scientific aspects and technical approaches are analyzed and researched in order to improve the sustainability of technical systems in future smart and mega cities.
The focus of research and teaching is based on the chair's research groups:

• Chip design for ICs (integrated circuits): analog (baseband, RF up to 500 GHz), mixed-signal, digital
• Power amplifiers and digital predistortion (DPD)
• System design (PCB level and system-on-chip)
• Radio channel modeling and simulation
• Algorithms for radar and communication systems
• Testing for communication, radar, and sensors
• Software-defined radio, cognitive radio, modem design
• Network architectures (6G, OpenRAN, ISAC, cooperative sensing, IIoT, campus networks, etc.)

Important aspects of all considerations are methods for increasing the resilience, security, energy efficiency, and sustainability of wireless applications.

The following topics and areas are part of the spectrum of interests and activities:

- Radio technology: transmission technology, intelligent antennas, mobile and broadcast radio, radar, sensor technology, indoor and outdoor positioning, spectroscopy, microphone technology
- Electronic communication systems
- Wired transmission technology in energy and automotive engineering
- Embedded industrial radio systems and campus networks: design, construction, and validation
- IoT devices and applications: implementation and testing of corresponding IoT electronic components
- Integrated circuits (RF/analog and mixed-signal) and RFIDs
- Medical and lifestyle technology: multiphysical circuits and systems

LITES is a core partner of Open6GHub, the 6G platform in Germany, AI Park, and coordinator of the 6G Valley innovation cluster.

International Audio Laboratories Erlangen (AudioLabs)

Prof. Dr.-Ing. J. Herre (Chair holder for Perceptual Audio Coding)
Prof. Dr.-Ing. B. Edler (Chair holder for Audio Signal Analysis)
Prof. Dr. E. Habets (Chair holder for Perception-based Spatial Audio Signal Processing)
Prof. Dr. M. Müller (Chair holder for Semantic Audio Signal Processing)
Prof. Dr. Nils Peters (Professorship for Audio Signal Processing)

Am Wolfsmantel 33, 91058 Erlangen, Secretariat: Room 3R4.06
The AudioLabs are located in the Fraunhofer IIS building.
Phone: 85 20500, E-mail: info@audiolabs-erlangen.de

- Audio data compression (mp3, AAC, ...)
- Psychoacoustics / models of the auditory system
- 3D audio / spatial audio playback
- Quality assessment of audio signals
- Audio signal analysis and classification
- Audio signal enhancement
- Parametric audio signal representations
- Microphone arrays
- Error concealment
- Music analysis and processing
- Acoustic virtual reality

Department of Computer Science

INF1 IT Security Infrastructures

Martensstraße 3, 91058 Erlangen
Phone: 85 69900
www.cs1.tf.fau.de
Prof. Dr. Felix Freiling

The chair represents the topic of IT security in teaching and research. The chair's research focuses on offensive IT security (attacks on IT systems, penetration tests, vulnerability analysis, malware analysis, reverse engineering), forensic computer science (IT evidence preservation and analysis), and interdisciplinary aspects of IT security (human factors, usability, economics, law).

INF4 Systemsoftware

Martensstraße 1, 91058 Erlangen, Secretary's office: Room 00.047
Phone: 85-27277, E-mail: cs4-sekretariat@fau.de
https://sys.cs.fau.de/
Prof. Dr.-Ing. Rüdiger Kapitza

Distributed systems and middleware, security aspects in distributed systems, fault-tolerant agreement protocol;
operating systems, system programming, trustworthy execution, real-time systems; energy-aware systems.

INF5 Pattern Recognition Lab

Martensstraße 3, 91058 Erlangen, Secretary's office: Room 09.138
Phone: 09131 / 85 27775,
E-mail: alexandra.hauske@fau.de
https://lme.tf.fau.de/
Prof. Dr.-Ing. Andreas Maier

Medical image processing: image registration, image analysis, segmentation, reconstruction, different acquisition modalities, discrete tomography, image enhancement.
Computer vision: Object tracking, object recognition, 3 D reconstruction, active sensor data selection, plenoptic modeling, augmented reality, autonomous mobile systems.
Speech processing: recognition/comprehension of spontaneous speech, dialogue systems, children's speech, emotion recognition, automatic evaluation of speech disorders, pronunciation evaluation in foreign language learning.
Digital sports: classification, signal processing, biosignals.

INF12 Hardware-Software-Co-Design

Cauerstraße 11, 91058 Erlangen, Secretary's office: Room 02.114-128
Phone: 85 25148
E-mail: cs12-sekretariat@fau.de
https://cs12.cms.rrze.uni-erlangen.de/
Prof. Dr.-Ing. Jürgen Teich
Prof. Dr. Rolf Wanka

Systematic design of embedded systems, co-simulation, design of massively parallel systems, architecture-compiler co-design, evolutionary optimization, design of low-loss and mobile systems, computer architecture, reconfigurable computing systems, real-time analysis, simulation, computer arithmetic, Cryptography, compiler technology, discrete optimization, design space exploration, hardware synthesis, high-level synthesis, design automation, swarm intelligence, routing methods, network topologies, load balancing methods, parallel sorting, approximation algorithms.

Department Artificial Intelligence in Biomedical Engineering

The Department Artificial Intelligence in Biomedical Engineering (AIBE) was established as part of the Hightech Agenda Bayern. The traditional chair structure has been abandoned to maximize internal exchange and cooperation. Artificial intelligence research at AIBE is centered around the study and development of intelligent systems in medicine. AIBE's research focuses on theoretical foundations as well as applications for future healthcare. The researchers possess a robust foundation not just in artificial intelligence, machine learning, computer science, and data science, but also in applying these concepts to biomedical engineering.

Machine Learning & Data Analytics Lab

Carl-Thiersch-Straße 2b, 91052 Erlangen, Secretary's office: Room 01.017
Phone: 85 28990
E-mail: irene.steinheimer@fau.de
https://www.mad.tf.fau.de/

The researchers in the Machine Learning and Data Analytics (MaD) lab conduct theoretical and applied research for wearable computing systems and machine learning algorithms for engineering applications at the intersection of sports and health care. Our motivation is generating a positive impact on human wellbeing, be it through increasing performance, maintaining health, improving rehabilitation, or monitoring disease.

Laboratory for Surgical Planning and Robotic Cognition (SPARC)

Werner-von-Siemens Straße 61
Phone: +49 9131 85-71271
E-mail (Administration): alessia.caria@fau.de
https://www.sparc.tf.fau.de/
Prof. Dr. Franziska Mathis-Ullrich

The laboratory for Surgical Planning and Robotic Cognition (SPARC) at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), led by Prof. Dr. Franziska Mathis-Ullrich, investigates cognition guided robots for surgical assistance in minimally invasive procedures, intelligent and flexible surgical instruments, and intuitive interfaces between humans and robots in the operating room.
The SPARC laboratory conducts interdisciplinary research in close collaboration with national and international partners. We aim to contribute to building a healthcare system that enables optimal and personalized treatment of patients through targeted interactions between surgical experts and the next generation of minimally invasive surgical robots and assistance systems.

Examination and Internship Regulations

The examination regulations relevant to the study of Autonomy Technologies are printed below for information (without guarantee of updating in the meantime). Listed are also links to the online offers of the university, where the current versions of the examination and internship regulations are stored.

General Degree Program and Examination Regulations for Bachelor's and Master's degree programs at the Faculty of Engineering of the University of Erlangen-Nürnberg:

https://www.doc.zuv.fau.de//L1/PO/Tech/Allgemeine_PO_Bachelor_Master/englisch/AB-MPO-TechFak_20070918_idF_20220726_en.pdf

Degree Program and Examination Regulations for the Bachelor's and Master's Degree Program in Autonomy Technologies at the University of Erlangen-Nürnberg (FPO).

See page: 50ff

Guidelines for the industrial internship training of Autonomy Technologies students at the Friedrich-Alexander University Erlangen-Nürnberg (Internship Guidelines).

See page: 62ff

Degree Program and Examination Regulations for Bachelor's and Master's Degree Program in Autonomy Technologies at the Faculty of Engineering of Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

– FPOAT –

Dated April 26, 2023

amended by statutes of
April 30, 2024

Based on Section 9 (1) in conjunction with Section 80 (1)(1), section 84 (2)(1), Section 88 (9), Section 90 (1)(2) and Section 96 (3)(1) of the Bavarian Higher Education Innovation Act dated August 5, 2022 **(BayHIG)**, Friedrich-Alexander-Universität Erlangen-Nürnberg enacts the following degree program and examination regulations:

Contents:

Part I: General Provisions

Section 39 Scope

These degree program and examination regulations govern studying and provisions for examinations in the Bachelor's degree program in Autonomy Technologies and the consecutive Master's degree program in Autonomy Technologies leading to Bachelor of Science or Master of Science degrees and supplements the General Examination Regulations for Bachelor's and Master's Degree Programs at the Faculty of Engineering of FAU – **ABMPO/TF** – in the currently valid version.

Section 40 Bachelor's Degree Program, Teaching and Examination Language, Related Degree Programs

(1) The Bachelor's degree program in Autonomy Technologies comprises modules worth a total of 180 ECTS credits pursuant to **Appendix 1** and includes a Bachelor's thesis with a presentation.

(2) In order to enroll on the Bachelor's degree program in Autonomy Technologies, applicants must provide proof of proficiency in English equivalent to level B1+ of the Common European Framework of Reference for Languages (CEFR) (B1+ for language proficiency, B2 for reading skills).

(3) [1]Notwithstanding Section 3 (6)(1) **ABMPO/TF**, the teaching and examination language in the Bachelor's degree program in Autonomy Technologies is English. [2]Individual courses and examinations that are not compulsory modules may be conducted in German. [3]The Bachelor's thesis shall be written in English; the Degree Program Committee shall decide on any exceptions at the student's request. [4]The degree certificate and final academic record shall be issued in German and English.

(4) Section 28 (1)(2)(2) **ABMPO/TF** does not apply to related degree programs.

Section 41 Master's Degree Program, Part-time Study, Teaching and Examination Language, Related Degree Programs

(1) [1]The Master's degree program in Autonomy Technologies builds on the contents of the Bachelor's degree program in Autonomy Technologies in accordance with these degree program and examination regulations. [2]It consists of modules worth 120 ECTS credits in total pursuant to **Appendix 2** or **3** and includes a Master's thesis with a presentation.

(2) The Master's degree program in Autonomy Technologies can be completed as a full-time **(Appendix 2)** or as a part-time **(Appendix 3)** degree program.

(3) [1]Notwithstanding Section 4 (5)(1) **ABMPO/TF**, the teaching and examination language in the Master's degree program in Autonomy Technologies is English. [2]Individual courses and examinations that are not compulsory modules may be conducted in German. [3]The Master's thesis shall be written in English; the chairperson of the Degree Program Committee shall decide on any exceptions at the student's request. [4]The degree certificate and final academic record shall be issued in German and English.

(4) The provisions in Section 34 (3)(2) **ABMPO/TF** do not apply to related degree programs.

Section 42 Specializations

(1) [1]Bachelor's students in Autonomy Technologies shall choose one of the following specializations and Master's students in Autonomy Technologies shall choose two of the following specializations in order to establish a subject-specific profile.

1. Human-System Interfaces
2. Networking & Collaboration
3. Planning & Control
4. Sensing & Perception

[2]The specialization modules offered within the chosen specializations are stated in the catalog of specialization modules approved by the Degree Program Committee and are announced in accordance with local practice in the module handbook before the lecture period begins.

(2) [1]The overriding learning outcome of the specializations which can be chosen pursuant to paragraph 1 is to allow students to gain more advanced knowledge in the selected specialization. [2]This should allow them to acquire skills of relevance to research.

(3) [1]In the specialization "Human-System Interfaces", students advance their know-ledge in human-machine interfaces and human-centric development for autonomous systems. [2]They acquire knowledge about human perception and information processing in order to implement corresponding interface components for input and output for a specific application (e.g. for robotics).

(4) [1]The specialization "Networking & Collaboration" considers the aspects of communication technology and signal processing for exchanging information and networking autonomous systems. [2]The knowledge imparted to the students also includes aspects of mobile communication and distributed algorithms.

(5) [1]In the specialization "Planning & Control", students acquire in-depth knowledge of dynamic decisions in autonomous systems, taking into account the ego and environment situation. [2]This includes control, optimization, and learning-based methods for influencing as well as predictive motion and decision planning of an autonomous system in a dynamically changing environment.

(6) [1]The specialization "Sensing & Perception" focuses on sensing the environment and other agents (people and systems). [2]Students acquire knowledge of the design and implementation of appropriate sensor systems based on various physical principles (e.g. wave-based and inertial) as well as suitable signal processing algorithms for the analysis and interpretation of data.

(7) [1]One examination achievement is stipulated per module. [2]Examinations in the modules shall take one of the following forms: written examination (60, 90, 120 min), oral examination (20-30 min), seminar achievement or laboratory achievement pursuant to Section 7(3) **ABMPO/TF**. [3] Section 7 (2)(3) **ABMPO/TF** stipulates that in justified exceptional circumstances, combinations of the individual achievements stated in sentence 3 may also be possible.

(8) [1]The specialization modules are generally worth 5 ECTS credits (typically lecture and tutorial are worth 4 SWS).
[2]Any exceptions to the size of the module and combinations of teaching units are detailed in the module handbook.

(9) The Degree Program Committee can approve other specializations and modules upon request, paragraph 7 applies.

Part II: Special Provisions

1. Bachelor's Examination

Section 43 Structure of the Bachelor's Degree Program

(1) [1]The Bachelor's degree program consists of compulsory, core, specialization and elective modules. The distribution across the semesters, the type and duration of the examinations and the required number of ECTS credits are stipulated in **Appendix 1**.

(2) Modules no. B1 to B25 in **Appendix 1** are compulsory.

(3) [1] The preliminary examination (Grundlagen- und Orientierungsprüfung; GOP) shall comprise modules worth 30 ECTS credits. [2]The GOP shall have been passed when the student has passed the module Mathematics I and achieved a further 22.5 ECTS credits from the modules marked "GOP" in **Appendix 1**.

(4) [1]In the fifth and sixth semester, students must choose two core modules (module group B26, 10 ECTS credits in total) and a specialization module (B27, 5 ECTS credits), a seminar and a laboratory course (module B28, 5 ECTS credits) from the specialization catalog. [2]When registering for the first examination in a module of a specialization, students select the specialization they wish to take. [3]A change of specialization shall only be permitted in justified exceptional cases with prior approval from the chairperson of the Degree Program Committee.

(5) [1]At least 5 ECTS credits must be obtained in key qualifications (modules B29 and B30). [2]The catalog is published before the beginning of the semester in accordance with local practice. [2]5 ECTS credits must be obtained from the elective modules from engineering subjects at the Faculty of Engineering (module B31). [2]5 ECTS credits must be obtained from elective modules taken from non-engineering subjects (module B32) from the degree programs offered across the University. [3]The type and scope of teaching units and examinations pursuant to Sentences 1 and 2 depend on the specific manner in which the respective module is taught and are regulated by the applicable **degree program and examination regulations** and/or the module handbook.

(6) [1]In addition, the Bachelor's degree program includes the Bachelor's thesis module pursuant to No. B33 in **Appendix 1**. [2]The degree program is completed with the Bachelor's thesis itself and a presentation of around 30 minutes.

(7) [1]Notwithstanding Section 32 (2)(3) **ABMPO/TF**, failed attempts in the modules B29 to B32 will not be counted when changing to alternative modules and it is still possible for students to change modules even after failing three attempts at the previous module. [2]In addition, in the event of a failure to pass, there is no obligation to repeat the failed examination within the legally stipulated period pursuant to Section 32 (1)(6) **ABMPO/TF**.

Section 44 Core and Specialization Modules Pursuant to the Specialization Catalog

(1) [1]The learning outcome of the core and specialization modules from the specialization catalog (B26 and B27 pursuant to **Appendix 1** and **4**) is to allow students to gain a more in-depth knowledge of selected skills such as the design and application of autonomous technologies. [2]Students gain analytical skills and can formulate mathematical descriptions for technical contexts. [3]The second learning outcome has a research focus, with students learning subject-related methods of research and exploring their subject in more depth. [4]Thirdly, the element of choice allows students to tailor their profile in view of their career plans.

(2) [1]The type and scope of the examination are dependent on the skills for the relevant module according to paragraph (1) and the module handbook. [2]Possible examinations for each module are: written examination (60 min, 90 min or 120 min) or an oral examination (30 min). [3]The catalog is published before the beginning of the semester in accordance with local practice.

(3) [1]Core and specialization modules amounting to 5 ECTS credits usually consist of a lecture (2 SWS) and a tutorial (2 SWS) or a lecture (3 SWS) and a tutorial (1 SWS). [2]Any exceptions are detailed in the module handbook.

Section 45 Seminar and Laboratory Course

(1) [1]The learning outcome of the seminar and laboratory course (module B28 pursuant to **Appendix 1**) is to allow students to gain initial insights into the topics of the areas of interest to them in their degree program pursuant to Section 42 and to gather, analyze and interpret information relevant to their subject. [2]A second learning outcome is aimed at promoting personal and social skills through preparing, reporting on and presenting a topic relating to the subject for a specialist audience at a Bachelor's degree level and in a manner tailored to suit the target group, as well as working under supervision in a group to develop and test subject-related applications and possibilities for implementation with respect to the chosen subject. [3]Thirdly, the element of choice allows students to tailor their profile in view of their career plans.

(2) [1]A seminar usually comprises 2 SWS and is completed with a graded seminar achievement. [2]A laboratory course usually comprises 3 SWS and is completed with an (ungraded) practical achievement. [3]Any exceptions to the scope of the lectures and seminars and the specific scope of the course and examination achievements are detailed in the module handbook.

(3) Section 44 (4) shall apply accordingly.

Section 46 Bachelor's Thesis

(1) Admission to the Bachelor's thesis shall be governed by Section 31 (3)(2) **ABMPO/TF**.

(2) [1]The Bachelor's thesis is intended to enable students to learn to solve problems relating to autonomy technologies independently. [2]Anyone employed as a university lecturer as their main occupation as defined in Section 19 (1) **BayHIG** at the Faculty of Engineering and involved in this degree program as their main occupation pursuant to Section 53 (4) **BayHIG** shall be entitled to assign and supervise Bachelor's theses. [3]Exceptions to this rule may be granted by the chairperson of the Degree Program Committee. [4]Requirements for the Bachelor's thesis shall be such that it can be completed with a workload of 300 hours.

(3) 10 ECTS credits are awarded for the Bachelor's thesis module, which includes a presentation of around 30 minutes in addition to the Bachelor's thesis itself.

Section 47 Evaluation of Achievements for the Bachelor's Degree Program

(1) The Bachelor's degree program shall have been completed successfully if proof of passing all modules stipulated in **Appendix 1** has been submitted.

(2) [1]The final grade shall be calculated using all graded modules and module groups set forth in **Appendix 1** including the Bachelor's thesis, weighted with a factor corresponding to the assigned ECTS credits. [2]An interim grade shall be given for each module group in accordance with the ECTS weighting of the individual modules.

2. Master's Examination

Section 48 Qualification for a Master's Degree, Certificates and Admission Requirements

(1) [1]A subject-specific degree as defined in Section 33 (1)(1) **ABMPO/TF** is a Bachelor's degree program in Autonomy Technologies pursuant to these degree program and examination regulations or a degree from a university in Germany or another country with a skills profile equivalent to that of this degree program. [2]Other Bachelor's degrees shall be recognized as subject-related degrees within the meaning of Section 33 (1)(1) **ABMPO/TF** if they provide evidence of the following skills:

- Mathematics: At least 22.5 ECTS credits, knowledge identical to that of modules B1 to B3 of **Appendix 1** of these degree program and examination regulations
- Mechatronics and automatic control: At least 20 ECTS credits, knowledge identical to that of modules B8, B10, B11 and B16 of **Appendix 1** of these degree program and examination regulations
- Electrical engineering: At least 15 ECTS credits, knowledge identical to that of modules B4 and B5 of **Appendix 1** of these degree program and examination regulations
- Computer science: At least 20 ECTS credits, knowledge identical to that of modules B19, B20 and B24 of **Appendix 1** of these degree program and examination regulations.

(2) [1]Within the meaning of subsection (2)(6)(3) of the **Appendix** to **ABMPO/TF**, additional proof of English language skills equivalent to at least Level B2 of the Common European Framework of Reference (CEFR) shall be provided by submitting either relevant school reports or certificates issued by a language school or university. [2]Proof of language skills can in particular be provided by submitting a school leaving certificate or a certificate issued by the school providing evidence that English lessons up to a level equivalent to B2 CEFR have been taken at school or evidence of having successfully completed the Test of English as a Foreign Language (TOEFL) with at least 80 points in the iBT or the International English Language Testing System (IELTS) with a score of 6.0 or above or other equivalent qualifications (please refer to the table of equivalence published by the FAU Language Centre). [3]Proof of

language proficiency does not need to be submitted if the applicant acquired their university entrance qualification or relevant undergraduate degree in English.

(3) [1]Notwithstanding paragraph 5(2) of the **Appendix to ABMPO/TF**, applicants with a subject-specific degree shall be deemed qualified for the Master's degree program in Autonomy Technologies if:

1. The final grade of the applicant's subject-specific degree in accordance with paragraph 1(1) or the applicant's subject-specific achievements to date is better than 2.00 or
2. at least two of the following compulsory modules in the Bachelor's degree program Autonomy Technologies or modules demonstrating equivalent skills from another university have been awarded the module grade of 2.7 or better:
   a) Module "Electrical engineering I"
   b) Module "Electrical engineering II"
   c) Module "Mechatronic components and systems"
   d) Module "Sensors"
   e) Module "Signal theory"
   f) Module "Digital signal processing"
   g) Module "Dynamical systems and control"
   h) Module "Machine learning for control systems"
   i) Module "Electric drives".

[2]Applicants who have completed their Bachelor's degree at another university must submit the module descriptions for the modules named above.

(4) [1]Applicants who cannot be admitted directly to the degree program in accordance with paragraph 3 will be evaluated pursuant to the following provisions. [2]Applicants with a subject-specific degree who do not meet the requirements of paragraph 3 and applicants with a subject-related degree in accordance with paragraph 1 sentence 2, whose final grade or average grade of previous achievements is at least "good" as defined in Section 22 (4) **ABMPO/TF** will be invited to an online admissions test held in English via a secure examination platform. [3]The date for the test will be communicated to applicants at least one week in advance. [4]Notwithstanding paragraph 7 of the Appendix to **ABMPO/TF**, the test will be conducted in the form of an open-book examination lasting 60 minutes and applicants will be expected to solve tasks in the fields of human-system interfaces, networking and collaboration, planning and control, sensing and perception and general engineering mathematics, particularly analysis and linear algebra. [5]Further information about the test and about the permitted aids will be communicated to the applicants when the test date is announced; Section 31 (7)(5) **ABMPO/TF** shall apply accordingly. [6]Applicants qualify for admission if they achieve the grade "gut" (good) as defined in Section 22 (1)(1)**ABMPO/TF** or better in the test. [7]Applicants who achieve lower grades in the admission tests will be deemed unsuitable and cannot be admitted to the Master's degree program.

Section 49 Scope and Structure of the Master's Degree Program

(1) The type and scope of the module examinations in the Master's degree program are stated in **Appendix 2** (full-time) or **Appendix 3** (part-time).

(2) The Master's degree program is divided into the following areas:

1. Two core modules from each of the two chosen specializations (10 ECTS credits per specialization) pursuant to **Appendix 4**
2. Four specialization modules from the two chosen specializations (20 ECTS credits per specialization) pursuant to Section 50
3. Elective modules from the range of modules offered across the University (15 ECTS credits) pursuant to Section 51

4. Seminar and laboratory course module worth 5 ECTS credits from the range of modules offered for the two specializations pursuant to Section 52
5. A team project or industrial internship pursuant to Section 53
6. Master's thesis including presentation (30 ECTS credits) pursuant to Section 54.

(3) [1]When registering for the first examination in a module of a specialization, students select the specialization they wish to take. [2]A change of specialization shall only be permitted in justified exceptional cases with prior approval from the chairperson of the Degree Program Committee.

(4) [1]Due to the specific subject competencies that are set out in each module description and that must be acquired as part of the qualification goals of the consecutive Bachelor's and Master's degree program, each module can only be taken once during the Master's degree program. [2]If modules from the range of core modules in the specialization have already been completed during the Bachelor's degree program, they must be replaced with other modules from the entire range of specialization modules offered for the chosen specialization.

(5) [1]Notwithstanding Section 32 (2)(3) **ABMPO/TF**, failed attempts will not be counted when changing to alternative modules and it is still possible for students to change modules even after failing three attempts at the previous module. [2]In addition, in the event of a failure to pass, there is no obligation to repeat the failed examination within the legally stipulated period pursuant to Section 32 (1)(6) **ABMPO/TF**.

Section 50 Core and Specialization Modules pursuant to the Specialization Catalog

(1) [1]The learning outcome of the core and specialization modules mentioned above is to allow students to gain a more in-depth knowledge of selected skills in their specialization pursuant to Section 42. [2]The second learning outcome has a research focus, with students learning subject-related methods of research and exploring their subject in more depth. [3]Thirdly, the element of choice allows students to tailor their profile in view of their career plans.

(2) [1] The type and scope of examinations depend on the skills taught in the respective module accounting for 5 ECTS credits pursuant to paragraph 1 and the module handbook. or, if so chosen by the student, two modules worth 2.5 ECTS credits.

[2]Possible examinations for each module are: written examination (60 min, 90 min or 120 min) or an oral examination (30 min). [3]The catalog is published before the beginning of the semester in accordance with local practice.

(3) [1]Core and specialization modules amounting to 5 ECTS credits usually consist of a lecture (2 SWS) and a tutorial (2 SWS) or a lecture (3 SWS) and a tutorial (1 SWS). [2]Any exceptions are detailed in the module handbook.

Section 51 Elective Modules from the University Module Catalog

(1) 15 ECTS credits must be obtained from elective modules from the range of modules offered across the University (module M5).

(2) The type and scope of teaching units and examinations pursuant to paragraph 1 depend on the specific manner in which the respective module is taught and are regulated by the applicable **(degree program and) examination regulations** and/or the module handbook.

Section 52 Seminar and Laboratory Course

(1) [1]The first learning outcome of the seminar and laboratory course module is to allow students to expand the knowledge they have already gained in their specialization pursuant to Section 38, in particular by working on complex problems within the scope of research-oriented projects. [2]A second learning outcome is aimed at promoting personal and social skills through independently preparing, reporting on, and presenting a topic from current research and defending ideas in a discussion at the Master's level, as well as working in a group to develop and test subject-related applications and possibilities for implementation with respect to the chosen subject. [3]Thirdly, the element of choice allows students to tailor their profile in view of their career plans.

(2) [1]A seminar usually comprises 2 SWS and is completed with a graded seminar achievement. [2]A laboratory course usually comprises 3 SWS and is completed with an (ungraded) practical achievement. [3]Any exceptions to the scope of the lectures and seminars and the specific scope of the course and examination achievements are detailed in the module handbook.

Section 53 Team Project, Practical Internship

(1) [1]The learning outcome of the team project module is to allow students to learn how to put academic work to practical use in research. [2]Upon completion of the team project, students will be able to independently conduct literature research and classify and analyze literature sources. [3]Furthermore, the students in the team are able to independently discuss the task set for them from the field of autonomy technologies within a given period of time using scientific methods and develop suitable approaches and concepts for solving it. [4]In addition, they have the knowledge required to present their scientific research results in presentations and research reports.

(2) [1]An industrial internship may be completed as an alternative to the team project. [2]The industrial internship must meet the guidelines for practical training for the Master's degree program Autonomy Technologies and be recognized by the Internship Office for Autonomy Technologies.

Section 54 Master's Thesis

(1) [1]In order to qualify for admission to the Master's thesis (Module M9 in **Appendix 2** or **3**), students shall be required to successfully complete modules pursuant to **Appendix 2** or **3** worth at least 80 ECTS credits. [2]The chairperson of the Degree Program Committee may grant exceptions upon the student's request.

(2) [1]The Master's thesis is intended to demonstrate the students' ability to solve problems in autonomy technologies independently. [2]Full-time university lecturers from the Faculty of Engineering involved in this degree program shall be entitled to assign and supervise Master's theses. [3]Exceptions to this rule may be granted by the chairperson of the Degree Program Committee.

(3) The Master's thesis module includes a presentation (approximately 30 minutes) and is worth 30 ECTS credits.

(4) Notwithstanding Section 36 (6)(1) **ABMPO/TF**, the Master's thesis shall be written in English.

Section 55 Evaluation of Achievements for the Master's Degree Program

(1) The Master's degree program shall have been completed successfully if all modules stipulated in **Appendix 2** or **Appendix 3** have been passed.

(2) [1]The final grade shall be calculated using all graded modules and module groups set forth in **Appendix 2** or **3** including the Master's thesis, weighted with a factor corresponding to the ECTS credits awarded. [2]An interim grade shall be given for each module group in accordance with the ECTS weighting of the individual modules.

Part III: Final Provisions

Section 56 Legal Validity

(1) [1]These degree program and examination regulations shall come into effect on the day after their publication. [2]They shall apply to all students who start the Bachelor's or Master's degree program Autonomy Technologies in the winter semester 2023/2024 or later.

(2) [1]The first amendment statute shall come into effect on October 1, 2024. It shall apply to all students starting their degree program as of winter semester 2024/2025 and to those Master's students studying in accordance with the FPOAT dated April 26, 2023 at the time the amendment statute comes into effect. With respect to Bachelor's students studying in accordance with the FPOAT dated April 26, 2023 at the date the amendment statute comes into effect, it shall apply with the exception of the amendments in Section 43 (3) concerning the preliminary examination (Grundlagen- und Orientierungsprüfung; GOP). The provisions stipulated to date to Section 39(3) of the FPOAT dated April 26, 2023 shall continue to apply for these students and the changes in module B19 (Algorithms, programming, and data representation) shall only apply to students who have not yet started examinations in this module (first attempt).

Appendix 1: Study Plan AT Bachelor - Start of winter semester (2024)

No.	Modules		Semester						Type of Examination
			1.	2.	3.	4.	5.	6.	
1	Mathematics I	(GOP)	7.5						EA (K90)
2	Mathematics II	(GOP)		7.5					EA (K90)
3	Mathematics III				7.5				EA (K90)
4	Electrical Engineering I	(GOP)	7.5						EA (K90)
5	Electrical Engineering II	(GOP)		7.5					EA (K90)
6	Introduction to MATLAB		2.5						CA
7	Introduction to Microwave Engineering				5				EA (K90)
8	Mechatronic Components and Systems					5			EA (K90)
9	Electrical Engineering Laboratory				2.5				CA
10	Electric Drives				5				EA (K90)
11	Sensors						5		EA (K90)
12	Signal Theory				5				EA (K90)
13	Stochastic Processes					5			EA (K90)
14	Digital Signal Processing						5		EA (K90)
15	Introduction to Communication Systems					5			EA (K90)
16	Dynamical Systems and Control					5			EA (K90)
17	Machine Learning for Control Systems						5		EA (K90)
18	Modeling of Control Systems						5		EA (K90)
19	Algorithms, Programming, and Data Representation	(GOP)	10						EA (K120)
20	System-level Programming	(GOP)		5					EA (K90)
21	Embedded Systems				5				EA (K90)
22	Numerics for Engineers I						5		EA (K60)
23	Simulation of Autonomous Systems					5			EA (K90)
24	Machine Learning for Engineers I			5					EA (K90)
25	Automation Laboratory							2.5	CA
Modules out of the catalog of areas of specialization									
26	Core module						5	5	EA see section 40 (2)
27	Specialization module or Core module							5	EA see section 40 (2)
28	Seminar & Laboratory							5	EA (SA) + CA (LA)
Electives and bachelor thesis									
29	Key Qualifications I		2.5						EA see section 39 (5)
30	Key Qualifications II					2.5			EA see section 39 (5)
31	Technical elective							5	EA see section 39 (5)
32	Non-technical elective			5					EA see section 39 (5)
33	Bachelor thesis with presentation							10	thesis
	Total ECTS: 180								

Explanations: GOP: preliminary examination, EA: graded examination achievement, CA: ungraded course achievement, SA: seminar achievement, LA: laboratory achievement

Appendix 2: AT Master

Modules		Semester breakdown								
No.		1st		2nd.		3rd		4th		
		SWS	ECTS	SWS	ECTS	SWS	ECTS	SWS	ECTS	
1	Specialization I: Core Modules	4	5	4	5					see 46 (2)
2	Specialization I: Modules	4	5	4	5	8	10			see 46 (2)
3	Specialization II: Core Modules	4	5	4	5					see 46 (2)
4	Specialization II: Modules	4	5	4	5	8	10			see 46 (2)
5	Elective subjects	8	10	4	5					see 47 (2)
6	Seminar & laboratory			4	5					see 48
7	Team project or engineering industrial internship						10			see 49
8	Master thesis with presentation								30	
	Sums SWS	24		24		16				
	Sums ECTS		30		30		30		30	

Guidelines for the Industrial Internship of Students in the Master's Program of Autonomy Technologies at the Friedrich-Alexander-University Erlangen-Nuremberg

(Internship Guidelines)
July 2023

Content

1. Purpose of the practical work experience (industrial internship)
The industrial internship is intended to provide insights into the organization and social structure of an industrial company and to introduce students to the professional activities of engineers.

Professional practical activity
The industrial internship must be completed in accordance with the guidelines for practical training in the Master's program Autonomy Technologies and must be recognized by the Internship Office Autonomy Technologies.

(Alternative team project: The qualification goal of the team project is to enable students to learn the practice of scientific work in research. Upon completion of the team project, students are able to independently conduct a literature search and to classify and analyze literature sources. Furthermore, the students are able to independently discuss the task assigned to them from the field of autonomy technologies within a specified period of time with the help of scientific methods and to develop suitable solution approaches and concepts. In addition, they have knowledge of the scientific presentation of the results obtained by means of presentations and research reports).

2. Duration and time allocation

2.1 Master's program
In order to pass the Master's program, a practical, engineering-related activity of at least 10 weeks must be proven.

2.2 General regulations
- The usual weekly working hours for full-time employment apply.
- Part-time employment of at least 8 hours per week is permissible. The crediting takes place on a pro rata basis.
- For employment of at least 17.5 h/week, five days of absence are permitted for the entire duration of the internship. Absences exceeding five working days must be made up. Public holidays do not count as days absent.
- In the case of employment with less than 17.5 h/week, days of absence cannot be taken into account.

3. Training guidelines
Engineering-related internship: Integration of the students into the working environment of engineers or correspondingly qualified persons with predominantly developing, planning or directing activities, e.g. research, development, design, calculation, testing, project planning, production planning, production control, logistics, plant management, engineering services, ...

4. Training places
The choice of suitable training places is left to the students themselves.
Training in higher education institutions, in one's own or one's parents' business, or in the business of one's spouse is not possible.
The Internship Office does not act as an intermediary, but can refer to various links here https://www.eei.tf.fau.de/studium/praktikumsamt/.

If difficulties arise, the Chambers of Industry and Commerce can generally provide advice.
Students are recommended to conclude a training contract with the company.

5. Recognition of an internship
Recognition of practical activity is done by the Internship Office.
For the proof of a section of the practical activity, the internship office must be provided with
- reports according to section 5.1
- activity certificates according to section 5.2
- the certificate according to section 5.3

Before starting an internship abroad or if there is any doubt about the recognition, it is recommended to consult the Internship Office.
After the completion of an internship period, the certificates should be submitted to the Internship Office for recognition as soon as possible, so that any incorrect certificates can still

be corrected without too much trouble. An application for recognition of the internship must be submitted here https://www.eei.tf.fau.de/studium/praktikumsamt/.

5.1 Reports

Reports must be prepared on the individual internship sections. The reports must be confirmed by the company by signature and company stamp.
A technical report of 1 ½ A4 pages is to be prepared per week, describing the work of one week or special details (work process, methods...) of the services rendered and containing sketches. It is also possible to prepare an internship report of the same length for the entire training period.

5.2 Activity certificates

In addition, activity certificates are kept (template under point 8). These are filled out in bullet point form. The number of total hours must be stated for each day and each week. The activity certificates must be confirmed by the company by signature and company stamp.

5.3 Certificate

The company shall issue the trainee with a report on the work carried out, the contents of which must correspond to the model under point 7. In particular, the certificate must contain the company letterhead, the full address of the company and details of the days of absence (even if no days of absence are to be recorded).
If the certificate or the activity records are not written in German or English, the Internship Office may request a certified translation.

5.4 Crediting of other previous achievements

- Activities that have been recognized by other German academic universities as internships in the same or a related course of study will be credited.
- Work as a student trainee will be recognized as an internship if the activity and the supporting documents comply with these guidelines.
- Periods of service in the German Armed Forces or in alternative service may be recognized in the bachelor's degree program if they comply with these guidelines. For recognition, a detailed certificate of the type and duration of the activities performed must be submitted to the Internship Office.
- A completed training at a technical secondary school or at a technical high school will be credited with 6 weeks as an internship in the bachelor's degree program, provided that the practical training took place in subject-related areas.

6. Final provisions

These policies shall become effective on the date they are announced by posting on the Faculty Council bulletin board.

7. Sample: Certificate

(Company letterhead)

Internship certificate

Mr./Mrs. ……

born on in …….

was employed from to ……

employed for practical training as follows:

Type of activity	Weeks
.....	.....
.....	.....
.....	.....
.....	.....
total	.....

Days of absence during the period of employment: ……..
The regular weekly working time was hours ……

Special remarks: .....
.....

(place):……, the.....

(Company stamp)

(signature)

Note: The certificate is issued by the company and must contain the full address of the company.

Activity Certificate

Name .....

Training Department .....

Week from **.....to** .....

Day	**Work performed, instructions, etc.**	**Working time**
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
	Hours per week	

Signature of the intern

Date

Signature of the supervisor

Company stamp

Emergency Phone Numbers and University Hospital Departments

In case of life-threatening emergencies, call…

112 **European Emergency Call Number / Rescue Coordination Centre**

Intoxication **+49 089 - 19240** **Poison Control Centre Munich**
+49 - 911 - 398 2451 **Poison Control Centre Nuremberg**

For urgent but non-life-threatening emergencies, call…

116 117 **Patient Service with 24/7 medical on-call service in German language**
https://www.116117.de/de/englisch.php

ACCIDENT AND EMERGENCY UNITS AT UNIVERSITÄTSKLINIKUM ERLANGEN

http://www.uk-erlangen.de/en/emergencies/

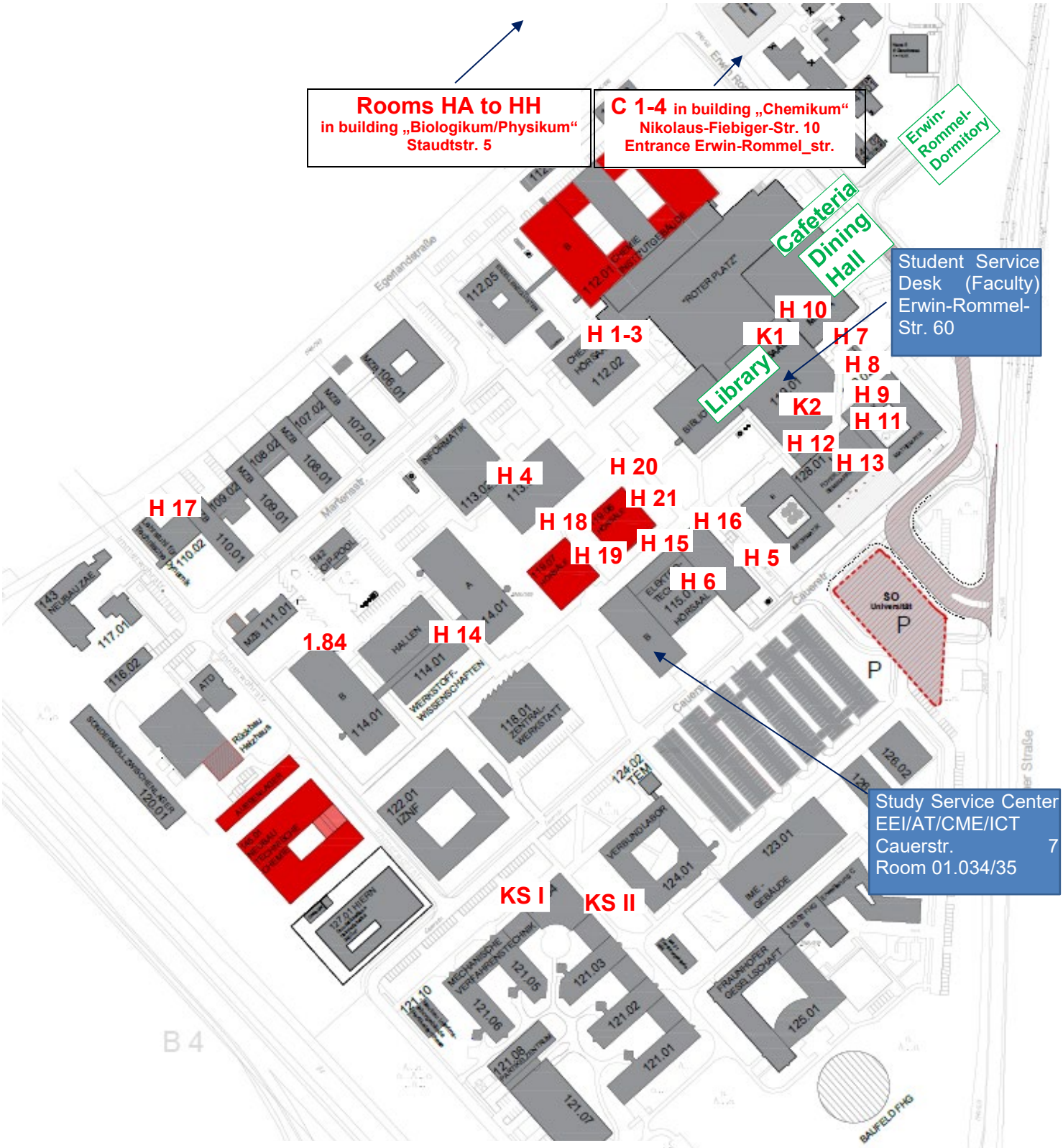
including Map of Erlangen with Directions to all Emergency Units!

Midwifery / Delivery Room Universitätsstr. 23 a	+49 9131 85 - **34900**
Accident and Emergency Unit for internal medicine (including Chest Pain Unit and Department of Dermatology) Ulmenweg 18, for cars via Krankenhausstr.	+49 9131 85 - **35420**
Accident and Emergency Unit for Paediatrics and Adolescent Medicine Loschgestr. 15	+49 9131 85 – **33118 or 33119**
Accident and Emergency Unit concerning head injuries (including Stroke Unit and mental emergencies) Schwabachanlage 6	+49 9131 85 - **34338**
Accident and Emergency Unit for Surgery Entrance Maximiliansplatz	+49 9131 85 - **33260**

ALL UNIVERSITY HOSPITAL DEPARTMENTS

http://www.uk-erlangen.de/en/about-us/all-institutions/

Site Plan of the Faculty of Engineering



Southern Campus Erlangen

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