Karlsruher Institut für Technologie

Module Handbook
Industrial Engineering and Management B.Sc.

SPO 2015

Summer semester 2026

Date: 02/04/2026

KIT DEPARTMENT OF BUSINESS AND ECONOMICS

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1 The Module Handbook: Your Guide Through Your Studies

Welcome to the **Module Handbook** for your study program at the KIT Department of Economics and Management. We are delighted to have you join us and wish you a successful start to the new semester! This handbook provides an essential introduction to the key terms and regulations governing the selection of modules, courses, and examinations within your program.

Your study program is structured around several disciplines (e.g., Business Administration, Economics, Operations Research). Each discipline is further divided into **modules**, with each module comprising one or more interrelated components that often lead to an examination. The scope of each module is defined by **Credit Points (CP)**, which are awarded upon successful completion. While some modules are compulsory, the program's interdisciplinary nature offers a wide range of individual specialization and deepening opportunities within many modules. This flexibility allows you to tailor the content and timeline of your studies according to your personal interests, career aspirations, and needs.

This module handbook serves as a comprehensive guide to the modules within your program. Specifically, it details:

- The **structure** of the modules
- Their **scope** (in CP)
- Module **dependencies**
- Expected **learning outcomes**
- **Assessment methods** and examinations

This handbook is an essential orientation and a helpful guide throughout your studies. Please note that it **complements, but does not replace, the course catalog**, which provides semester-specific and variable course details such as timetables and locations.

1.1 Module Selection and Completion

Each module and each examination can only be selected once. If an examination is selectable within multiple modules, the student's decision on its assignment to a specific module is made at the moment of registration for that examination.

A module is considered completed and passed when its module examination is successfully passed (achieving a grade of 4.0 or better). For modules where the module examination is subdivided into several partial examinations, the module is completed only when all necessary partial examinations have been successfully passed. If a module offers alternative partial examinations, the module examination is considered concluded with the examination that leads to or exceeds the required total credit points. The module grade, reflecting the weight of its predefined credit points, is then included in the overall grade calculation for the study program.

1.2 Module Versions and Revisions

Modules are periodically revised, for instance, due to the introduction of new courses or the cancellation of existing examinations. As a rule, a new module version is created, which applies to all students who are newly starting the module. Students who have already commenced a module, however, are generally "grandfathered" and remain subject to the conditions of the module version valid at the time they began. These students can complete the module under the same conditions as at the beginning (exceptions are regulated by the Examination Board). The decisive date for this is the student's "binding declaration" regarding the choice of the module, as defined by §5(2) of the Study and Examination Regulations. This binding declaration is established by registering for the first examination within that module.

1.3 Accessing Module Handbook Versions

All modules in this handbook are presented in their current version, with the version number indicated in each module description. Older module versions can be accessed via previous module handbooks in the archive at: http://www.wiwi.kit.edu/Archiv_MHB.php.

1.4 Examination Formats and Registration

Module examinations can be taken either as a comprehensive general examination or as partial examinations. If offered as a general examination, the entire learning content of the module will be assessed in a single examination. If the module examination is subdivided, the content of each constituent course will be examined in corresponding partial examinations.

Registration for examinations can be done online via the campus management portal. The following functions are available at https://campus.studium.kit.edu/:

- Register/unregister for examinations
- Check examination results
- Create transcript of records

For further and more detailed information, please refer to: https://campus.studium.kit.edu/faq.php.

1.5 Grading, Repetition Rules, and Types of Assessment

Examinations are categorized into written examinations, oral examinations, and alternative assessment types ("Prüfungsleistungen anderer Art"). All examinations are graded. Ungraded coursework ("Studienleistungen"), on the other hand, can be repeated multiple times and do not receive a grade.

Generally, a failed written exam, oral exam, or alternative assessment can be repeated only once. Should this repeat examination (including any provided oral repeat examination) also be failed, the right to take the examination is forfeited. A request for a second repetition must be submitted in writing to the Examination Board two months after forfeiting the examination right. For more information, please see: http://www.wiwi.kit.edu/hinweiseZweitwdh.php.

1.6 Examiners

The Examination Board has appointed the KIT examiners and lecturers listed in this module handbook for the modules and their respective courses as official examiners for the courses they offer.

1.7 Additional Achievements

Additional achievements are voluntarily undertaken graded assessments that do not impact the student's overall grade. They can pertain to single courses or entire modules. It is mandatory to declare an additional achievement as such at the time of registration for the respective assessment. Additional achievements totaling at most 30 CP may be listed on the final certificate.

1.8 Important Resources and Legal Framework

For current information regarding your studies at the KIT Department of Economics and Management, please visit our website www.wiwi.kit.edu, as well as our channels on Instagram, LinkedIn, and YouTube. Please also consult the current notices and announcements for students at: https://www.wiwi.kit.edu/studium.php.

Comprehensive information regarding the legal and regulatory framework of your study program can be found in the respective study and examination regulations. These documents are available under the Official Announcements of KIT at: http://www.sle.kit.edu/amtlicheBekanntmachungen.php.

1.9 Contact

If you have any questions about modules or exams, please contact the examination office of the KIT Department of Economics and Management:

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2 General Information

2.1 Study program details

KIT-Department	KIT Department of Business and Economics
Academic Degree	Bachelor of Science (B.Sc.)
Examination Regulations Version	2015
Regular semesters	6 semesters
Maximum semesters	9 semesters
Credits	180
Language	German and English
Grade calculation	Weighted by (Weight * CP)
Additional Information	Link to study program www.wiwi.kit.edu/studiengangWiingBSc.php Department https://www.wiwi.kit.edu/index.php Business unit Studium und Lehre https://www.sle.kit.edu/vorstudium/bachelor-wirtschaftsingenieurwesen.php

2.2 Content

The Bachelor's degree program in Industrial Engineering and Management is divided into a **foundation program** with compulsory modules (standard duration of study 1st - 3rd semester with a total of 92 credit points (CP)) and a **specialization program** with compulsory elective modules (standard duration of study 4th - 6th semester with a total of 88 CP).

The course is strongly oriented towards quantitative methods. The basis for this is laid in the foundation course through compulsory modules with three courses in mathematics (analysis, linear algebra, differential equations), two courses in statistics (descriptive and inductive statistics, probability theory, regression) and two courses in operations research (various optimization models and methods). In the other compulsory modules, these foundations are taken up and continued with subject-specific focal points.

The interdisciplinary Bachelor's degree program in Industrial Engineering aims to provide a broad qualification in the following five thematic core areas: Business Administration, Economics, Informatics, Operations Research and Engineering. In the specialization program, the study regulations allow students to choose their specialization through elective options, whereby at least one module (9 CP, which usually corresponds to two lectures with exercises) must be completed for each of the five core areas in order to ensure the desired breadth of qualification of the Karlsruhe industrial engineer. In the compulsory elective area, a seminar module and two further modules must be taken. One of these modules must be chosen from business administration or engineering. Otherwise, students can choose modules from informatics, operations research, business administration, economics, engineering, statistics, law or sociology. A full-time internship of at least 12 weeks provides an insight into company practice and the professional development potential of industrial engineering.

At least one seminar and the Bachelor's thesis teach the ability to write and present an independent scientific paper. The opportunity for international exchange is provided within the framework of ERASMUS programs and bilateral direct cooperation programs.

In economics and business administration, all common empirical methods are used in addition to specific theoretical approaches: from the collection and analysis of field data to laboratory experiments and computer-aided simulations.

The business administration program covers the areas of accounting, finance, corporate management, information management, production management and marketing. The economics program includes micro- and macroeconomic theories, industrial economics and network economics, finance and economic policy as well as political economics.

In Operations Research, methods and models of continuous, discrete, stochastic and dynamic optimization are taught and algorithmically implemented.

Informatics is dedicated to both the theoretical foundations and practical methods for the use of information and communication technology in business, administration and society.

In the field of engineering, the basic course introduces students to materials science, technical mechanics and electrical engineering, while the specialization course draws on the wide range of courses offered by the KIT engineering departments, which offer a variety of specialization options in the fields of mechanical and civil engineering, electrical engineering and information technology.

Special features of the degree program

- Anchoring of the program at the KIT Department of Business and Economics
- Individual curriculum design
- Free choice of specialization in the engineering subjects from semester 4 onwards
- 12-week work placement during the course of study
- High proportion of computer science
- Practical relevance through modules such as the "Business & Technology" team project
- Faculty-internal "International Relations Office" to support stays abroad
- Possibility of a German-French double degree as part of the Master's program. Application is made during the Bachelor's degree course.
- Bridge courses and courses during the semester at the MINT-Kolleg
- Partner network with companies for company contacts and internships during your studies
- KIT start-up incubator

2.3 Qualification Goals

The sound methodological training enables graduates to apply subject-specific concepts, methods, models and procedures and to link these in an interdisciplinary way. They are able to analyze and evaluate economic and technological structures and processes. They master the basics of project management and can assume responsibility in interdisciplinary teams. They are able to argue on a subject-related and interdisciplinary basis and defend their point of view vis-à-vis specialist representatives and laypersons. They have the ability to apply the knowledge they have acquired in a professional field in industry, the service sector or public administration and to take up a Master's degree in Industrial Engineering and Management or a related course of study.

Key Qualifications:

The Industrial Engineering and Management program is characterized by an exceptional degree of interdisciplinarity. With the combination of subjects from business administration, economics, computer science, operations research, mathematics as well as engineering and natural sciences, the integration of knowledge from different disciplines is an inherent part of the degree program. Interdisciplinary thinking and thinking in contexts are promoted naturally.

In addition, the tutorial models with over 20 semester hours in the Bachelor's degree program contribute significantly to the promotion of soft skills. The key qualifications taught throughout the entire degree program can be assigned to the following areas:

Basic skills (soft skills)

- Teamwork, social communication and creativity techniques
- Presentation preparation and presentation techniques
- Logical and systematic argumentation and writing
- Structured problem-solving and communication

Practical orientation (enabling skills)

- Competence to act in a professional context
- Project management skills
- Basic knowledge of business administration
- English as a technical language

Orientation knowledge

- Imparting interdisciplinary knowledge
- Institutional knowledge of economic and legal systems
- Knowledge of international organizations
- Media, technology and innovation

The integrative teaching of key qualifications takes place in particular as part of a series of compulsory courses within the Bachelor's programs, namely

- Basic program in business administration and economics
- Seminar module
- Bachelor thesis support
- Work placement
- Specialization modules in business administration, economics, informatics.

2.4 Employment Prospects

You will gain your first practical experience during your Bachelor's degree, not only through your compulsory work placement. You can also gain insights and contacts in the world of work through your participation in lectures and workshops with speakers from the business world and the opportunity to write your thesis in a company.

This will open up career prospects for you as a specialist and manager anywhere in industry, services and public administration where economic and technical issues come together, be it at the interfaces of project and production management, human resources and IT or marketing and logistics. Alternatively, after completing your Bachelor's degree, you can also opt for a Master's degree.

2.5 Acceptance Criterias

The program offers 505 study places and admission is restricted.
Admission is granted for the first semester in the winter semester and for the higher semester in the winter and summer semesters.

Application deadline:

German or EU nationals
1.**First semester:** July 15
Second semester: July 15 for the winter semester, January 15 for the summer semester

Citizens from non-EU countries
1.**1st semester:** 15 July
Higher semester: 15 July for the winter semester, 15 January for the summer semester

2.6 Studies and Examination Regulations

The legal basis for the degree program and the examinations in the degree program is the

Study and Examination Regulations of the Karlsruhe Institute of Technology (KIT) for the Bachelor's degree program in Industrial Engineering and Management

2.7 Organizational issues

Dates and events:

Current information on the degree programs as well as dates for information events and examinations can be found on the KIT department website (https://www.wiwi.kit.edu).

Frequently asked questions

Answers to frequently asked questions from A for "thesis" to Z for "second repetition" can be found in our Hints A-Z.

Recognition of achievements according to § 19 SPO

1. Achievements within the university system

   According to § 19 of the Study and Examination Regulations, study and examination achievements that have been completed in study programs at state or state-recognized universities and vocational academies in the Federal Republic of Germany or at foreign state or state-recognized universities can be recognized upon application by the student.

2. Achievements outside the higher education system

   Knowledge acquired outside the higher education system can also be recognized. A common example is the recognition of one or more internships through proof of relevant vocational training.
   For detailed information on the recognition process and the link to the application forms, please refer to the website of the KIT department.

3 Study plan

The Bachelor's degree program in Industrial Engineering and Management entails a six-semester standard study period. The basic program in the first three semesters is systematically structured. In the fourth to fifth semesters, a more advanced, specialization program that can be structured depending on one's personal interests and goals is offered.

Figure 2 shows the course and module structure with the respective credit points as well as an example of a possible distribution of modules and courses in the basic program over the semesters, which has proven to be useful.

	Term	Credits	Business Administration	Economics	Informatics	Operations Research	Engineering	Statistics	Mathematics	Electives	Internship Bachelor Thesis
Basic Program	1 (WT)	28	Mangement and Marketing 5 LP	ECON 1 5 CP	PROG 1 5 CP		Mat. Science (MS) 1 3 CP		MATH 1 10 CP		
	2 (ST)	34	Financing and Accounting 5 LP	ECON 2 5 CP	INFO 1 5 CP	OR 9 LP	Eng. Mech. (EM) 1 3 CP	STAT 1 5 CP	MATH 2 7 CP		
	3 (WT)	30	Production, Logistics and Inf. Systems 5 CP		INFO 2 5 CP		Electr. Eng. 1 3 CP AFoE 3 CP	STAT 2 5 CP	MATH 3 4 CP		
Specialization Program	4 (ST)	31		ECON 9 CP	INFO 9 CP	OR 9 CP				Seminar 3 CP	Internship 10 CP
	5 (WT)	27	BUS 9 CP				ENG 9 CP			2 Elective Modules (one from BUS/ENG) 9 CP + 9 CP	
	6 (ST)	30									Bachelor Thesis 12 CP
		180									

Figure 2: Structure of the Bachelor's degree program in Industrial Engineering and Management SPO 2015 as of winter semester 2021/2022 (recommended)

In the **basic program** (blue), the business administration, economics, informatics, operations research, engineering sciences, statistics and mathematics modules are compulsory. In the 3rd semester, one can choose between Material Transformation and Balances, Engineering Mechanics and Material Science in the engineering basic module.

In the **specialization program** (green), a module must be selected from each of the following areas: business administration, economics, informatics, operations research and engineering. As part of the mandatory courses, one seminar module (independent of the course) and two modules must be completed. One module can be selected from business administration or engineering subjects and the other from business administration, economics, informatics, operations research, engineering, statistics, law or sociology.

The **internship** can be completed before or during the Bachelor's program. The performance record of the completed internship is required for registration for the final module examination in the course.

One is free to structure his/her individual course plan as he/she wishes (taking into account the respective provisions of the study and examination regulations as well as applicable module regulations) and choose the semester he/she wishes to start and/or complete the selected modules. It is however strongly recommended to adhere to the proposal for the first three semesters. The content of the courses is interdisciplinary and coordinated accordingly; the intersection freedom of lectures and examination dates is guaranteed for the recommended study semester.

All modules of the basic and advanced program, including the various alternatives within the module, can be found in this module handbook. Seminars that can be taken up as part of the seminar module are published at the WiWi portal at https://portal.wiwi.kit.edu/Seminare.

4 New study plan as of winter semester 2021/2022

For the winter semester 2021/2022, the basic program in the subjects business administration and mathematics has been changed. In the subject business administration, three modules, each worth 5 credit points, must be completed. In mathematics, the distribution of credit points for the three compulsory modules will change.

5 Study Program Structure

Mandatory	
Preliminary Exam *This field will not influence the calculated grade of its parent.*	
Bachelor's Thesis	12 CP
Internship	10 CP
Business Administration	24 CP
Economics	19 CP
Informatics	24 CP
Operations Research	18 CP
Engineering Sciences	21 CP
Mathematics	21 CP
Statistics	10 CP
Compulsory Elective Modules	21 CP

5.1 Preliminary Exam

Mandatory				
M-WIWI-100950	Preliminary Exam	DE	WS+SS	0 CP

5.2 Bachelor's Thesis

Credits
12

Mandatory				
M-WIWI-101601	Bachelor's Thesis	DE	WS+SS	12 CP

5.3 Internship

Credits
10

Mandatory				
M-WIWI-101419	Internship		Once	10 CP

5.4 Business Administration

Credits
24

Mandatory				
M-WIWI-105768	Management and Marketing	DE	WS	5 CP
M-WIWI-105769	Financing and Accounting	DE	SS	5 CP
M-WIWI-105770	Production, Logistics and Information Systems	DE	WS	5 CP
Specialisation Program Business Administration (Election: at least 9 credits)				
M-WIWI-101498	Management Accounting	EN	see notes	9 CP
M-WIWI-101434	eBusiness and Service Management	DE	WS+SS	9 CP
M-WIWI-101402	eFinance	DE/EN	WS+SS	9 CP
M-WIWI-101464	Energy Economics	DE/EN	WS+SS	9 CP
M-WIWI-101435	Essentials of Finance	DE	SS	9 CP
M-WIWI-105610	Financial Data Science	EN	SS	9 CP
M-WIWI-107454	Financial Data Science in Practice	EN	WS+SS	9 CP
M-WIWI-102752	Fundamentals of Digital Service Systems	EN	WS+SS	9 CP
M-WIWI-101424	Foundations of Marketing	DE/EN	WS+SS	9 CP
M-WIWI-105928	HR Management & Digital Workplace	DE/EN	WS+SS	9 CP
M-WIWI-101437	Industrial Production I	DE/EN	WS+SS	9 CP
M-WIWI-105981	Information Systems & Digital Business	DE/EN	WS+SS	9 CP
M-WIWI-106860	Leadership & Sustainable HR-Management	DE	WS+SS	9 CP
M-WIWI-105482	Machine Learning and Data Science	EN	WS+SS	9 CP
M-WIWI-101425	Strategy and Organization	DE	WS+SS	9 CP
M-WIWI-101465	Topics in Finance I	DE/EN	WS+SS	9 CP
M-WIWI-101423	Topics in Finance II	DE/EN	WS+SS	9 CP
M-WIWI-107451	Entrepreneurial Thinking and Action: Fundamentals of Entrepreneurship	DE/EN	WS+SS	9 CP

5.5 Economics

Credits
19

Mandatory				
M-WIWI-101398	Introduction to Economics		WS+SS	10 CP
Specialisation Program Economics (Election: at least 9 credits)				
M-WIWI-106472	Advanced Macroeconomics	EN	WS+SS	9 CP
M-WIWI-101499	Applied Microeconomics	DE	WS+SS	9 CP
M-WIWI-101403	Public Finance	DE	WS+SS	9 CP
M-WIWI-101599	Statistics and Econometrics	DE/EN	WS+SS	9 CP
M-WIWI-105414	Statistics and Econometrics II	DE/EN	WS+SS	9 CP
M-WIWI-101668	Economic Policy I	DE/EN	WS+SS	9 CP
M-WIWI-101501	Economic Theory	DE/EN	WS+SS	9 CP

5.6 Informatics

Credits
24

Mandatory				
M-WIWI-101417	Foundations of Informatics	DE/EN	WS+SS	10 CP
M-WIWI-101581	Introduction to Programming	DE	WS	5 CP
Specialisation Program Informatics (Election: at least 9 credits)				
M-WIWI-105112	Applied Informatics		WS+SS	9 CP

5.7 Operations Research

Credits
18

Mandatory				
M-WIWI-101418	Introduction to Operations Research	DE	SS	9 CP
Specialisation Program Operations Research (Election: 1 item)				
M-WIWI-101413	Applications of Operations Research	DE	WS+SS	9 CP
M-WIWI-101414	Methodical Foundations of OR	DE	WS+SS	9 CP
M-WIWI-103278	Optimization under Uncertainty	DE	WS+SS	9 CP

5.8 Engineering Sciences

Credits
21

Mandatory				
M-ETIT-101155	Electrical Engineering		WS	3 CP
M-MACH-101259	Engineering Mechanics	DE	WS	3 CP
M-WIWI-101839	Additional Fundamentals of Engineering	DE	WS+SS	3 CP
M-MACH-101260	Materials Science		WS	3 CP
Specialisation Program Engineering Sciences (Election: at least 9 credits)				
M-WIWI-101404	Extracurricular Module in Engineering		Once	9 CP
M-MACH-106995	Automation and Material Flow in Logistics	DE	WS+SS	9 CP
M-MACH-107717	Rail System Technology and Rail Vehicle Technology neu	DE	WS+SS	9 CP
M-MACH-107658	Data Driven Engineering Fundamentals neu	EN	WS	9 CP
M-WIWI-104838	Introduction to Natural Hazards and Risk Analysis	DE	WS+SS	9 CP
M-ETIT-106821	Electric Energy Systems and Power Generation	DE	SS	9 CP
M-MACH-101264	Handling Characteristics of Motor Vehicles	DE/EN	WS+SS	9 CP
M-MACH-101265	Vehicle Development	DE/EN	WS+SS	9 CP
M-MACH-101266	Automotive Engineering	DE/EN	WS+SS	9 CP
M-MACH-101276	Manufacturing Technology	DE	WS	9 CP
M-BGU-101004	Fundamentals of Construction	DE	WS+SS	9 CP
M-MACH-101272	Integrated Production Planning	DE	SS	9 CP
M-MACH-106527	Mechanical Design A	DE	WS	9 CP
M-MACH-106236	Mechatronic Product Design	DE	WS	9 CP
M-ETIT-106581	Measurement, Control, and Manufacturing Measurement Technology	DE	SS	9 CP
M-MACH-101287	Microsystem Technology	DE	WS+SS	9 CP
M-MACH-101267	Mobile Machines		WS	9 CP
M-BGU-101067	Mobility and Infrastructure	DE	SS	9 CP
M-MACH-106590	Production Engineering	DE	WS+SS	9 CP
M-ETIT-106372	Signals and Systems	DE	WS	9 CP
M-MACH-101275	Combustion Engines I		WS	9 CP
M-MACH-101303	Combustion Engines II	DE	WS+SS	9 CP
M-MACH-101261	Emphasis in Fundamentals of Engineering		WS+SS	9 CP
M-MACH-101262	Emphasis Materials Science	DE	WS+SS	9 CP
M-MACH-101286	Machine Tools and Industrial Handling	DE	WS	9 CP

5.9 Mathematics

Credits
21

Mandatory				
M-MATH-105754	Mathematics 1	DE	WS	10 CP
M-MATH-105756	Mathematics 2	DE	SS	7 CP
M-MATH-105757	Mathematics 3	DE	WS	4 CP

5.10 Statistics

Credits
10

Mandatory				
M-WIWI-101432	Introduction to Statistics	DE	WS+SS	10 CP

5.11 Compulsory Elective Modules

Credits
21

Election notes
Within the scope of the elective compulsory area, the seminar module (independent of subject) and two modules are to be taken. One module must be chosen from the subjects Business Administration or Engineering Sciences, the other from the subjects Business Administration, Economics, Informatics, Operations Research, Engineering Sciences, Statistics, Law or Sociology.

Mandatory				
M-WIWI-101816	Seminar Module	DE/EN	WS+SS	3 CP
Business Administration oder Engineering Sciences (Election: 9 credits)				
M-WIWI-101404	Extracurricular Module in Engineering		Once	9 CP
M-MACH-106995	Automation and Material Flow in Logistics	DE	WS+SS	9 CP
M-MACH-107717	Rail System Technology and Rail Vehicle Technology neu	DE	WS+SS	9 CP
M-WIWI-101498	Management Accounting	EN	see notes	9 CP
M-WIWI-101434	eBusiness and Service Management	DE	WS+SS	9 CP
M-WIWI-101402	eFinance	DE/EN	WS+SS	9 CP
M-WIWI-104838	Introduction to Natural Hazards and Risk Analysis	DE	WS+SS	9 CP
M-ETIT-106821	Electric Energy Systems and Power Generation	DE	SS	9 CP
M-WIWI-101464	Energy Economics	DE/EN	WS+SS	9 CP
M-WIWI-101435	Essentials of Finance	DE	SS	9 CP
M-MACH-101264	Handling Characteristics of Motor Vehicles	DE/EN	WS+SS	9 CP
M-MACH-101265	Vehicle Development	DE/EN	WS+SS	9 CP
M-MACH-101266	Automotive Engineering	DE/EN	WS+SS	9 CP
M-MACH-101276	Manufacturing Technology	DE	WS	9 CP
M-WIWI-105610	Financial Data Science	EN	SS	9 CP
M-WIWI-107454	Financial Data Science in Practice	EN	WS+SS	9 CP
M-WIWI-102752	Fundamentals of Digital Service Systems	EN	WS+SS	9 CP
M-BGU-101004	Fundamentals of Construction	DE	WS+SS	9 CP
M-WIWI-101424	Foundations of Marketing	DE/EN	WS+SS	9 CP
M-WIWI-105928	HR Management & Digital Workplace	DE/EN	WS+SS	9 CP
M-WIWI-101437	Industrial Production I	DE/EN	WS+SS	9 CP
M-WIWI-105981	Information Systems & Digital Business	DE/EN	WS+SS	9 CP
M-MACH-101272	Integrated Production Planning	DE	SS	9 CP
M-WIWI-106860	Leadership & Sustainable HR-Management	DE	WS+SS	9 CP
M-WIWI-105482	Machine Learning and Data Science	EN	WS+SS	9 CP
M-MACH-106527	Mechanical Design A	DE	WS	9 CP
M-ETIT-106581	Measurement, Control, and Manufacturing Measurement Technology	DE	SS	9 CP
M-MACH-101287	Microsystem Technology	DE	WS+SS	9 CP
M-MACH-101267	Mobile Machines		WS	9 CP
M-BGU-101067	Mobility and Infrastructure	DE	SS	9 CP
M-MACH-106590	Production Engineering	DE	WS+SS	9 CP
M-ETIT-106372	Signals and Systems	DE	WS	9 CP
M-WIWI-101425	Strategy and Organization	DE	WS+SS	9 CP
M-WIWI-101421	Supply Chain Management	DE/EN	WS+SS	9 CP
M-WIWI-105447	Team Project Management and Technology (BUS/ENG)	DE/EN	WS+SS	9 CP
M-WIWI-101465	Topics in Finance I	DE/EN	WS+SS	9 CP
M-WIWI-101423	Topics in Finance II	DE/EN	WS+SS	9 CP
M-WIWI-107451	Entrepreneurial Thinking and Action: Fundamentals of Entrepreneurship	DE/EN	WS+SS	9 CP
M-MACH-101275	Combustion Engines I		WS	9 CP
M-MACH-101303	Combustion Engines II	DE	WS+SS	9 CP
M-MACH-101261	Emphasis in Fundamentals of Engineering		WS+SS	9 CP
M-MACH-101262	Emphasis Materials Science	DE	WS+SS	9 CP
M-MACH-101286	Machine Tools and Industrial Handling	DE	WS	9 CP
Business Administration (Election: at most 9 credits)				
M-WIWI-101498	Management Accounting	EN	see notes	9 CP
M-WIWI-101434	eBusiness and Service Management	DE	WS+SS	9 CP

M-WIWI-101402	eFinance	DE/EN	WS+SS	9 CP
M-WIWI-101464	Energy Economics	DE/EN	WS+SS	9 CP
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M-WIWI-105981	Information Systems & Digital Business	DE/EN	WS+SS	9 CP
M-WIWI-106860	Leadership & Sustainable HR-Management	DE	WS+SS	9 CP
M-WIWI-105482	Machine Learning and Data Science	EN	WS+SS	9 CP
M-WIWI-101425	Strategy and Organization	DE	WS+SS	9 CP
M-WIWI-101421	Supply Chain Management	DE/EN	WS+SS	9 CP
M-WIWI-101465	Topics in Finance I	DE/EN	WS+SS	9 CP
M-WIWI-101423	Topics in Finance II	DE/EN	WS+SS	9 CP
M-WIWI-107451	Entrepreneurial Thinking and Action: Fundamentals of Entrepreneurship	DE/EN	WS+SS	9 CP
Economics (Election: at most 9 credits)				
M-WIWI-106472	Advanced Macroeconomics	EN	WS+SS	9 CP
M-WIWI-101499	Applied Microeconomics	DE	WS+SS	9 CP
M-WIWI-101403	Public Finance	DE	WS+SS	9 CP
M-WIWI-101599	Statistics and Econometrics	DE/EN	WS+SS	9 CP
M-WIWI-105414	Statistics and Econometrics II	DE/EN	WS+SS	9 CP
M-WIWI-101668	Economic Policy I	DE/EN	WS+SS	9 CP
M-WIWI-101501	Economic Theory	DE/EN	WS+SS	9 CP
Informatics (Election: at most 9 credits)				
M-WIWI-101426	Electives in Informatics	DE/EN	WS+SS	9 CP
Operations Research (Election: at most 9 credits)				
M-WIWI-101413	Applications of Operations Research	DE	WS+SS	9 CP
M-WIWI-101414	Methodical Foundations of OR	DE	WS+SS	9 CP
M-WIWI-103278	Optimization under Uncertainty	DE	WS+SS	9 CP
Engineering Sciences (Election: at most 9 credits)				
M-WIWI-101404	Extracurricular Module in Engineering		Once	9 CP
M-MACH-106995	Automation and Material Flow in Logistics	DE	WS+SS	9 CP
M-MACH-107717	Rail System Technology and Rail Vehicle Technology neu	DE	WS+SS	9 CP
M-MACH-107658	Data Driven Engineering Fundamentals neu	EN	WS	9 CP
M-WIWI-104838	Introduction to Natural Hazards and Risk Analysis	DE	WS+SS	9 CP
M-ETIT-106821	Electric Energy Systems and Power Generation	DE	SS	9 CP
M-MACH-101264	Handling Characteristics of Motor Vehicles	DE/EN	WS+SS	9 CP
M-MACH-101265	Vehicle Development	DE/EN	WS+SS	9 CP
M-MACH-101266	Automotive Engineering	DE/EN	WS+SS	9 CP
M-MACH-101276	Manufacturing Technology	DE	WS	9 CP
M-BGU-101004	Fundamentals of Construction	DE	WS+SS	9 CP
M-MACH-101272	Integrated Production Planning	DE	SS	9 CP
M-MACH-106527	Mechanical Design A	DE	WS	9 CP
M-MACH-106236	Mechatronic Product Design	DE	WS	9 CP
M-ETIT-106581	Measurement, Control, and Manufacturing Measurement Technology	DE	SS	9 CP
M-MACH-101287	Microsystem Technology	DE	WS+SS	9 CP
M-MACH-101267	Mobile Machines		WS	9 CP

M-BGU-101067	Mobility and Infrastructure	DE	SS	9 CP
M-MACH-106590	Production Engineering	DE	WS+SS	9 CP
M-ETIT-106372	Signals and Systems	DE	WS	9 CP
M-MACH-101275	Combustion Engines I		WS	9 CP
M-MACH-101303	Combustion Engines II	DE	WS+SS	9 CP
M-MACH-101261	Emphasis in Fundamentals of Engineering		WS+SS	9 CP
M-MACH-101262	Emphasis Materials Science	DE	WS+SS	9 CP
M-MACH-101286	Machine Tools and Industrial Handling	DE	WS	9 CP
Statistics (Election: at most 9 credits)				
M-WIWI-101599	Statistics and Econometrics	DE/EN	WS+SS	9 CP
M-WIWI-105414	Statistics and Econometrics II	DE/EN	WS+SS	9 CP
Law or Sociology (Election: at most 9 credits)				
M-INFO-105084	Public and Civil Law		WS+SS	9 CP
M-GEISTSOZ-101167	Sociology/Empirical Social Research	DE	WS	9 CP
Team Project (Election: at most 9 credits)				
M-WIWI-105440	Team Project Management and Technology	DE/EN	WS+SS	9 CP

6 Modules

M 6.1 Module: Additional Fundamentals of Engineering [M-WIWI-101839]

Coordinators: Prof. Dr.-Ing. Alexander Fidlin
PD Dr. Volker Gaukel
Prof. Dr. Michael Hoffmann

Organisation: KIT Department of Business and Economics

Part of: Engineering Sciences (mandatory)

Credits	Grading	Recurrence	Duration	Language	Level	Version
3 CP	graded	Each term	1 term	German	3	5

Compulsory Elective Courses (Election: between 3 and 5 credits)			
T-MACH-102210	Introduction to Engineering Mechanics II : Dynamics	5 CP	Fidlin
T-ETIT-100534	Electrical Engineering for Business Engineers, Part II	5 CP	Brodatzki
T-CIWVT-114347	Fundamentals of Chemical Engineering	3 CP	Wehinger
T-MACH-102079	Material Science II for Business Engineers	5 CP	Wagner

Assessment
See course description.

Prerequisites
None

Competence Goal
See German version.

Content
The module focuses on basic engineering topics related to materials science, engineering mechanics and food processing.

Additional Information
Please note that "Materials Science 2" and "Electrical Engineering II for Industrial Engineers" are not offered in the winter semester, but only in the summer semester.

Workload
The total workload for this module is approximately 90 hours.

M 6.2 Module: Advanced Macroeconomics [M-WIWI-106472]

Coordinators: Prof. Dr. Johannes Brumm
Organisation: KIT Department of Business and Economics
Part of: Economics (Specialisation Program Economics)
Compulsory Elective Modules (Economics)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	English	3	2

Compulsory Elective Courses (Election:)			
T-WIWI-112723	Computational Macroeconomics	4,5 CP	Brumm
T-WIWI-112735	Macroeconomics: Theory and Computation	9 CP	Brumm
T-WIWI-109121	Macroeconomic Theory	4,5 CP	Brumm

Assessment
The module examination takes place either in the form of an overall examination of 9 LP on the course Macroeconomic Theory and the course Computational Macroeconomics, or via two individual examinations of 4.5 LP each. The duration of the overall examination is 120 minutes. The duration of an individual exam is 60 minutes. The examinations are offered every semester and can be repeated at any regular examination date.

Competence Goal
The student

- acquires knowledge of modern macroeconomic models
- is able to analyze and discuss fiscal and monetary policy issues
- understands algorithms for solving dynamic, stochastic models
- is able to apply learned numerical methods independently

Content
The module focuses on teaching both theoretical foundations and solution procedures for macroeconomic models.

Additional Information
The two courses can be taken in any order. They complement each other, but do not build on each other.

Workload
The total workload for this module is approximately 270 hours. The exact distribution is made according to the credit points of the courses of the module.

6.3 Module: Applications of Operations Research [M-WIWI-101413]

Coordinators: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Business and Economics
Part of: Operations Research (Specialisation Program Operations Research)
Compulsory Elective Modules (Operations Research)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German	3	9

Compulsory Elective Courses (Election: between 1 and 2 items)			
T-WIWI-102704	Facility Location and Strategic Supply Chain Management	4,5 CP	Nickel
T-WIWI-102714	Tactical and Operational Supply Chain Management	4,5 CP	Nickel
Supplementary Courses (Election: at most 1 item)			
T-WIWI-102726	Global Optimization I	4,5 CP	Stein
T-WIWI-106199	Modeling and OR-Software: Introduction	4,5 CP	Nickel
T-WIWI-106545	Optimization under Uncertainty	4,5 CP	Rebennack

Assessment
The assessment is carried out as partial exams (according to § 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
At least one of the courses*Facility Location and strategic Supply Chain Management*and*Tactical and operational Supply Chain Management*has to be taken.

Competence Goal
The student

- is familiar with basic concepts and terms of Supply Chain Management,
- knows the different areas of Supply Chain Management and their respective optimization problems,
- is acquainted with classical location problem models (in the plane, on networks and discrete) as well as fundamental methods for distribution and transport planning, inventory planning and management,
- is able to model practical problems mathematically and estimate their complexity as well as choose and adapt appropriate solution methods.

Content
Supply Chain Management is concerned with the planning and optimization of the entire, inter-company procurement, production and distribution process for several products taking place between different business partners (suppliers, logistics service providers, dealers). The main goal is to minimize the overall costs while taking into account several constraints including the satisfaction of customer demands.

This module considers several areas of Supply Chain Management. On the one hand, the determination of optimal locations within a supply chain is addressed. Strategic decisions concerning the location of facilities like production plants, distribution centers or warehouses are of high importance for the rentability of supply chains. Thoroughly carried out, location planning tasks allow an efficient flow of materials and lead to lower costs and increased customer service. On the other hand, the planning of material transport in the context of Supply Chain Management represents another focus of this module. By linking transport connections and different facilities, the material source (production plant) is connected with the material sink (customer). For given material flows or shipments, it is considered how to choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints.

Furthermore, this module offers the possibility to learn about different aspects of the tactical and operational planning level in Suppy Chain Management, including methods of scheduling as well as different approaches in procurement and distribution logistics. Finally, issues of warehousing and inventory management will be discussed.

Additional Information
The planned lectures and courses for the next three years are announced online at https://dol.ior.kit.edu/Lehrveranstaltungen.php.

Workload
The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

Recommendations
The courses Introduction to Operations Research I and II are helpful.

M 6.4 Module: Applied Informatics [M-WIWI-105112]

Coordinators: Dr.-Ing. Tobias Käfer
Prof. Dr. Andreas Oberweis
Prof. Dr. Melanie Volkamer

Organisation: KIT Department of Business and Economics

Part of: Informatics (Specialisation Program Informatics)

Credits	Grading	Recurrence	Duration	Level	Version
9 CP	graded	Each term	1 term	3	3

Advanced Programming (Election: 1 item)			
T-WIWI-102747	Advanced Programming - Java Network Programming	4,5 CP	Ratz, Zöllner
T-WIWI-102748	Advanced Programming - Application of Business Software	4,5 CP	Klink, Oberweis, Schreiber, Ullrich
Compulsory Elective Area (Election: 1 item)			
T-WIWI-110340	Applied Informatics – Applications of Artificial Intelligence	4,5 CP	Käfer
T-WIWI-114156	Applied Informatics – Cybersecurity	4,5 CP	Volkamer
T-WIWI-110341	Applied Informatics – Database Systems	4,5 CP	Oberweis
T-WIWI-113957	Applied Informatics – Mobile Computing	4,5 CP	Schiefer
T-WIWI-110338	Applied Informatics – Modelling	4,5 CP	Fritsch, Oberweis

Assessment

The assessment is carried out as two partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

- Partial exam I: *Advanced Programming - Java Network Programming* or alternativly *Advanced Programming - Application of Business Software*
- Partial exam II: all the rest

The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

When every singled examination is passed, the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Competence Goal

The student

- has the capability of dealing with the practical application of the Java programming language (which is the dominating programming language in many application areas) or alternatively the ability to configure, parameterize and deploy enterprise software to enable, support and automate business processes,
- knows in depth methods and systems of a core area or a core application area of Informatics according to the contents dealt with in the lectures,
- can choose these methods and system situation adequately and can furthermore design and employ them for problem solving,
- is able to independently find strategic and creative answers in the finding of solutions to well defined, concrete, and abstract problems.

Content

In this module, object-oriented programming skills using the Java programming language are further deepened. Alternatively important fundamentals of business information systems are conveyed that enable, support and accelerate new forms of business processes and organizational forms. Based on a core application area, basic methods and techniques of computer science are presented.

Workload

The total workload for this module is approximately 270 hours. For further information see German version.

M 6.5 Module: Applied Microeconomics [M-WIWI-101499]

Coordinators: Prof. Dr. Johannes Philipp Reiß
Organisation: KIT Department of Business and Economics
Part of: Economics (Specialisation Program Economics)
Compulsory Elective Modules (Economics)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German	3	6

Compulsory Elective Courses (Election: at least 9 credits)			
T-WIWI-112228	Digital Markets and Market Design	4,5 CP	Hillenbrand
T-WIWI-114598	Digital Markets and Mechanisms	4,5 CP	Rosar
T-WIWI-102892	Economics and Behavior	4,5 CP	Mill
T-WIWI-114622	Introduction to Econometrics	5 CP	Schienle
T-WIWI-102850	Introduction to Game Theory	4,5 CP	Puppe, Reiß
T-WIWI-115079	Experimental Economics (Bachelor)	4,5 CP	Rau
T-WIWI-102844	Industrial Organization	4,5 CP	Reiß
T-WIWI-102739	Public Revenues	4,5 CP	Wigger
T-WIWI-100005	Competition in Networks	4,5 CP	Mitusch

Assessment
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
None.

Competence Goal
Students

- are introduced to the basic theoretical analysis of strategic interaction situations and shall be able to analyze situations of strategic interaction systematically and to use game theory to predict outcomes and give advice in applied economics settings, (course "Introduction to Game Theory");
- are exposed to the basic problems of imperfect competition and its implications for policy making; (course "Industrial Organization");
- are provided with the basic economics of network industries (e.g., telecom, utilities, IT, and transport sectors) and should get a vivid idea of the special characteristics of network industries concerning planning, competition, competitive distortion, and state intervention, (course "Competition in Networks").

Content
The module's purpose is to extend and foster skills in microeconomic theory by investigating a variety of applications. Students shall be able to analyze real-life problems using microeconomics.

Workload
Total workload for 9 credit points: approx. 270 hours.

The exact distribution is based on the credit points of the courses in the module.

Recommendations
Completion of the module Economics is strongly recommended.

M 6.6 Module: Automation and Material Flow in Logistics [M-MACH-106995]

Coordinators: Prof. Dr.-Ing. Kai Furmans
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	German	3	2

Automation and material flow in logistics (Election:)			
T-MACH-113566	Automation and Autonomy in Logistics	4,5 CP	Brenner, Furmans
T-MACH-113013	Basics of Technical Logistics	4,5 CP	Mittwollen
T-MACH-112968	Material Flow in Production and Logistics	4,5 CP	Furmans

Assessment
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
none

Competence Goal
The student

- acquires comprehensive and well-founded knowledge on the main topics of logistics, an overview of different logistic questions in practice and knows the functionality of material handling systems,
- is able to illustrate logistic systems with adequate accuracy by using simple models,
- is able to realize coherences within logistic systems,
- is able to evaluate logistic systems by using the learnt methods.
- has an understanding of the various approaches and possibilities of automation and autonomy in logistics and can describe the associated technical requirements and approaches.

Content
The module Automation and Material Flow in Logistics provides the basics for the main topics in logistics and industrial material flows. The lectures illustrate the interaction of different modules of logistics systems. Depending on the specialisation, the technical features of conveyor technology are discussed in detail on the one hand, and on the other hand, methods for mapping and evaluating logistics systems are taught. The various levels and possibilities of automation and autonomy in logistics are analysed and the technical implementation is discussed and tested using practical experiments, models and approaches.

Workload
The total workload for this module is approximately 270 hours (9 credits). The allocation is based on the credit points of the module's courses.

Recommendations
none

Teaching and Learning Methods
see individual courses

6.7 Module: Automotive Engineering [M-MACH-101266]

Coordinators: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	4	8

Automotive Engineering (Election: at least 9 credits)			
T-MACH-102203	Automotive Engineering I	9 CP	Gauterin, Gießler
T-MACH-112126	Data-Driven Algorithms in Vehicle Technology	4 CP	Scheubner
T-MACH-100092	Automotive Engineering I (in German)	6 CP	Gießler
T-MACH-102117	Automotive Engineering II (in German)	4 CP	Gießler
T-MACH-102116	Fundamentals for Design of Motor-Vehicle Bodies I	1,5 CP	Bardehle
T-MACH-102119	Fundamentals for Design of Motor-Vehicle Bodies II	1,5 CP	Bardehle
T-MACH-110796	Python Algorithms for Vehicle Technology	4 CP	Rhode
T-MACH-102156	Project Workshop: Automotive Engineering	4,5 CP	Frey, Gießler
T-MACH-111820	Control of Mobile Machines – Prerequisites	0 CP	Becker, Geimer
T-MACH-111821	Control of Mobile Machines	4 CP	Becker, Geimer
T-MACH-114435	Automotive Engineering II	4,5 CP	Gießler
T-MACH-113912	Mathematical Methods in Hydraulics	4 CP	Geimer
T-MACH-113913	Tutorial Mathematical Methods in Hydraulics	2 CP	Geimer

Assessment
The assessment is carried out as partial exams.

The partial exams consists of a written exam (duration 90 to 120 minutes) or an oral exam (duration 30 to 40 minutes).

Prerequisites
None

Competence Goal
The student

- knows the most important components of a vehicle,
- knows and understands the functioning and the interaction of the individual components,
- knows the basics of dimensioning the components.

Content
In the module Automotive Engineering the basics are taught, which are important for the development, the design, the production and the operation of vehicles. Particularly the primary important aggregates like engine, gear, drive train, chasis and auxiliary equipment are explained, but also all technical equipment, which make the operation safer and easier. Additionally the interior equipment is examined, which shall provide a preferably comfortable, optimum ambience to the user.

In the module Automotive Engineering the focus is on passenger cars and commercial vehicles, which are designed for road applications.

Workload
The total work load for this module is about 270 Hours (9 Credits). The partition of the work load is carried out according to the credit points of the courses of the module. The work load for courses with 6 credit points is about 180 hours, for courses with 4.5 credit points about 135 hours, for courses with 3 credit points about 90 hours, and for courses with 1.5 credit points about 45 hours. The total number of hours per course results from the time of visiting the lectures and exercises, as well as from the exam duration and the time that is required to achieve the objectives of the module as an average student with an average performance.

Recommendations

Knowledge of the content of the courses *Engineering Mechanics I* [2161238] and *Engineering Mechanics II* [1262276] is helpful.

Teaching and Learning Methods

The teaching and learning procedures (lecture, lab course, workshop) are described for each course of the module separately.

6.8 Module: Bachelor's Thesis [M-WIWI-101601]

Coordinators: Studiendekan des KIT-Studienganges
Organisation: KIT Department of Business and Economics
Part of: Bachelor's Thesis

Credits	Grading	Recurrence	Duration	Language	Level	Version
12 CP	graded	Each term	1 term	German	3	6

Mandatory			
T-WIWI-103067	Bachelor's Thesis	12 CP	Studiendekan des KIT-Studienganges

Assessment
The Bachelor's thesis is a written piece of work that demonstrates that the student is capable of dealing with a problem from their subject in an academic manner. It is regulated in detail in 14 SPO 2015.

The thesis is supervised and assessed by at least two KIT examiners. At least one of the examiners must be a professor and usually an examiner at the KIT Department of Economics and Management

The regular processing time is 6 months. Upon justified request by the student, the examination board can extend the processing time by a maximum of one month. If the Bachelor's thesis is not completed and submitted to the examiner by the deadline, it will be graded as "insufficient" unless the student is not responsible for this failure (e.g. maternity leave).

The Examination Board determines the languages in which the Bachelor's thesis can be written. At the student's request, the examiner may authorize the Bachelor's thesis to be written in a language other than German. The topic can only be returned once and only within the first month of the completion period. A new topic must be submitted and issued within four weeks.

If the thesis is not passed, it may be repeated once. A new topic must be issued. The same topic may not be repeated. This also applies to comparable topics. In case of doubt, the examination board will decide. The new topic may again be supervised by the examiners of the first thesis.

This regulation also applies analogously after an official withdrawal from a registered topic.

The module grade is the grade for the Bachelor's thesis.

Prerequisites
Prerequisites for admission to the Bachelor Thesis: minimum of 120 credits must be earned. All module examinations of the basic program must be passed.

At the request of the student, the examination committee decides on exceptions to these regulations.

It is recommended to begin the Bachelor Thesis in the 5th or 6th Semester.
A written confirmation of the examiner about supervising the Bachelor's Thesis is required.
Please pay regard to the institute specific rules for supervising a Bachelor Thesis.
The Bachelor Thesis has to contain the following declaration in German:

„Ich versichere wahrheitsgemäß, die Arbeit selbstständig verfasst, alle benutzten Hilfsmittel vollständig und genau angegeben und alles kenntlich gemacht zu haben, was aus Arbeiten anderer unverändert oder mit Abänderungen entnommen wurde sowie die Satzung des KIT zur Sicherung guter wissenschaftlicher Praxis in der jeweils gültigen Fassung beachtet zu haben.“

If this declaration is not given, the Bachelor Thesis will not be accepted.

Competence Goal
The student can independently work on a relevant topic in accordance with scientific criteria within the specified time frame.

He/she is in a position to research, analyze the information, abstract and identify basic principles and regulations from less structured information.

He/she reviews the task ahead, can select scientific methods and techniques and apply them to solve a problem or identify further potential. This is basically also done under consideration of social and/or ethical aspects.

He/she can interpret, evaluate and if required, graphically present the obtained results.

He/she is in a position to clearly structure a research paper and communicate in writing using the technical terminology.

Content
The Bachelor Thesis is the first major scientific work. The topic of the Bachelor Thesis will be chosen by the student themselves and adjusted with the examinor. The topic has to be related to Industrial Engineering and Management and has to refer to subject-specific or interdisciplinary problems.

Workload
The preparation and presentation of the Bachelor's thesis is expected to take a total of approx. 360 hours. In addition to writing the thesis, this figure includes all necessary activities such as literature research, familiarization with the topic, familiarization with any necessary tools, conducting studies/experiments, supervision meetings, etc.

M 6.9 Module: Combustion Engines I [M-MACH-101275]

Coordinators: Prof. Dr. Thomas Koch
Dr.-Ing. Heiko Kubach

Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Level	Version
9 CP	graded	Each winter term	1 term	4	5

Wahlpflicht (Election: between 1 and 2 items)			
T-MACH-111550	CO2-Neutral Combustion Engines and their Fuels I	5 CP	Koch
T-MACH-111585	Hydrogen and reFuels - Energy Conversion in Combustion Engines	4 CP	Kubach

Assessment
The module examination contains of two oral examinations. The module score results from the two scores weighted according to the ECTS.

Prerequisites
None

Competence Goal
The student can name and explain the working princile of combustion engines. He is able to analyse and evaluate the combustion process. He is able to evaluate influences of gas exchange, mixture formation, fuels and exhaust gas aftertreatment on the combustion performance. He can solve basic research problems in the field of engine development.

The student can name all important influences on the combustion process. He can analyse and evaluate the engine process considering efficiency, emissions and potential.

Content
Working Principle og ICE

Characteristic Parameters

Characteristic parameters

Engine parts

Crank drive

Fuels

Gasolien engine operation modes

Diesel engine operation modes

Emissions

Fundamentals of ICE combustion

Thermodynamics of ICE

Flow field

Wall heat losses

Combsution in Gasoline and Diesel engines

Heat release calculation

Waste heat recovery

CO2-free engine technology

Workload
regular attendance: 62 hours
self-study: 208 hours

M 6.10 Module: Combustion Engines II [M-MACH-101303]

Coordinators: Dr.-Ing. Heiko Kubach
Julia Reichel

Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German	4	4

Mandatory			
T-MACH-111560	CO2-Neutral Combustion Engines and their Fuels II	5 CP	Koch
Verbrennungsmotoren II (Election: at least 4 credits)			
T-MACH-105173	Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines	4 CP	Gohl
T-MACH-105649	Boosting of Combustion Engines	4 CP	Kech, Lachenmaier
T-MACH-105184	Fuels and Lubricants for Combustion Engines	4 CP	Kehrwald
T-MACH-110817	Development of Hybrid Drivetrains	4 CP	Koch
T-MACH-110816	Large Diesel and Gas Engines for Ship Propulsions	4 CP	Weisser
T-MACH-105044	Fundamentals of Catalytic Exhaust Gas Aftertreatment	4 CP	Deutschmann, Grunwaldt, Kubach, Lox
T-MACH-105167	Analysis Tools for Combustion Diagnostics	4 CP	Pfeil
T-MACH-105169	Engine Measurement Techniques	4 CP	Bernhardt
T-MACH-111578	Sustainable Vehicle Drivetrains	4 CP	Toedter
T-MACH-105985	Ignition Systems	4 CP	Toedter

Assessment
The assessment consists of an oral exam (60 min) taking place in the recess period (according to §4 (2), 2 of the examination regulation). The exam takes place in every semester. Reexaminations are offered at every ordinary examination date.

Prerequisites
It is only possible to choose this module in combination with the module *Combustion Engines I*. The module is passed only after the final partial exam of *Combustion Engines I* is additionally passed.

The course *Combustion Engines II* [2134131] has to be attended.

Competence Goal
See courses.

Content
Compulsory:

Supercharging and air management

Engine mapsEmissions and Exhaust gas aftertreatment

Transient engine operationECU application

Electrification and alternative powertrains

Elective:

Fuels and lubricants for ICE

Fundamentals of catalytic EGA

Analysis tools for combustion diagnostics

Engine measurement techniques

Analysis of Exhaust Gas und Lubricating Oil in Combustion Engines

Workload
regular attendance: 62 h
self-study: 208 h

Teaching and Learning Methods
Lecture, Tutorial

M 6.11 Module: Data Driven Engineering Fundamentals [M-MACH-107658]

Coordinators: Prof. Dr.-Ing. Anne Meyer
Organisation: KIT Department of Mechanical Engineering
Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each winter term	2 terms	English	3	1

Mandatory			
T-MACH-114078	Data Science Fundamentals in Engineering	4 CP	Meyer
T-MACH-115104	Python-Basics Course	1 CP	Meyer
Compulsory Elective Area (Election: at least 4 credits)			
T-MACH-115042	Applied Data Science and Machine Learning in Engineering	4 CP	Meyer
T-MACH-114767	CAD Workshop	4 CP	Rönnau
T-MACH-113507	CAE-Basics	3 CP	Düser
T-MACH-113899	CAE-Basics Workshop	1 CP	Düser
T-MACH-115010	Project: Data-Driven Engineering Fundamentals	4 CP	Meyer

Competence Goal
After successfully completing the module, students will be able to

1. **Explain data and AI strategies in engineering processes**, assess the strategies in addition to simulation and optimization approaches and analyze technical data sources in terms of quality, structure and suitability for machine learning.
2. **Apply exploratory data analysis, statistical models, machine learning and basic deep learning methods** and design and implement complete end-to-end pipelines (data preparation, model training, validation, deployment) with modern Python libraries.
3. **Critically evaluate model performance**, address limitations and uncertainties and present results in written, oral and multimedia formats appropriate to the target audience.
4. **Apply modern CAD and CAE methods for the development of a simple (mechatronic) prototype**, plan, model and analyze digital product development workflows (e.g. FEM, stress analysis) and document and present the results in a technically sound manner using a self-built prototype.
5. **Plan, implement and coordinate team-oriented engineering projects**.

Content
The module provides a comprehensive basic framework for the practical application of data-driven methods in engineering.

Core topics **Data Science Fundamentals in Engineering**
Introduction to data sources, data quality, explorative data analysis, statistical modeling, basic ML methods (regression, classification, clustering) and the fundamentals of deep learning for technical applications.

Core topics **Python-Basics Course**
Practice-oriented self-study course on Python programming, Python syntax, programming environments, Python libraries for data science in engineering

Core topics **Applied Data Science and Machine Learning in Engineering**
In-depth study of technical aspects of industrial data sources (databases, REST APIs), messaging (MQTT), versioning and collaboration tools (GitLab) and scalable cluster computing (HPC at KIT)

Core topics **CAD workshop**
Team project for collaborative product development using modern CAD systems; prototype development, documentation and live demonstration

Core topics **CAE basics & workshop**
Basics of CAD, parametric modeling, finite element analysis (FEA)

Core topics **Project: Data-Driven Engineering Fundamentals**
Team-oriented structuring and solution of a problem from the areas of product development, production systems, logistics and robotics by selecting suitable data-driven methods

Workload
Total workload for 9 credit points: approx. 270 hours. The exact distribution is based on the credit points of the courses in the module.

6.12 Module: eBusiness and Service Management [M-WIWI-101434]

Coordinators: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Business and Economics
Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German	3	12

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-111307	Digital Services: Foundations	4,5 CP	Holtmann
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CP	Weinhardt
T-WIWI-113746	Enterprise Systems for Financial Accounting & Controlling	4,5 CP	Fleig, Mädche
T-WIWI-109816	Foundations of Interactive Systems	4,5 CP	Mädche
T-WIWI-107506	Platform Economy	4,5 CP	Weinhardt
T-WIWI-109940	Special Topics in Information Systems	4,5 CP	Weinhardt
T-WIWI-114596	Sustainability in E-Business	4,5 CP	Heßler, Pfeiffer

Assessment
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
None

Competence Goal
The students

- understand the strategic and operative design of information and information products,
- analyze the role of information on markets,
- evaluate case studies regarding information products,
- develop solutions in teams.

Content
This module gives an overview of the mutual dependencies of strategic management and information systems. The central role of information is exemplified by the structuring concept of the information life cycle.

The single phases of this life cycle from generation over allocation until dissemination and use of the information are analyzed from a business and microeconomic perspective, applying classical and new theories. The state of the art of economic theory on aspects of the information life cycle are presented. The lecture is complemented by exercise courses. The courses "Platform Economy", "eFinance: Information systems in finance" and "eServices" constitute three different application domains in which the basic principles of the Internet Economy are deepened. In the core lecture "Platform Economy" the focus is set on markets between two parties that act through an intermediary on an Internet platform. Topics discussed are network effects, peer-to-peer markets, blockchains and marketdesign. The course is held in English and teaches parts of the syllabus with the support of a case study in which students analyze a platform.

The course "eFinance: information systems for securities trading" provides theoretically profound and also practical-oriented background about the functioning of international financial markets. The focus is placed on the economic and technical design of markets as information processing systems.

In "eServices" the increasing impact of electronic services compared to the traditional services is outlined. The Information- und Communication Technologies enable the provision of services, which are mainly characterized by interactivity and individuality. This course provides basic knowledge about the development and management of ICT-based servies.

The theoretic fundamentals of Information systems can be enriched by a practical experience in Special Topics in Information Engineering and Management. Any practical Seminar at the IM can be chosen for the course Special Topics in Information systems.

Additional Information

All practical Seminars offered at the IM can be chosen for *Special Topics in Information Systems.* Please update yourself on www.iism.kit.edu/im/lehre

Workload

The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

M 6.13 Module: Economic Policy I [M-WIWI-101668]

Coordinators: Prof. Dr. Ingrid Ott
Organisation: KIT Department of Business and Economics
Part of: Economics (Specialisation Program Economics)
Compulsory Elective Modules (Economics)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	3	10

Mandatory			
T-WIWI-103213	Basic Principles of Economic Policy	4,5 CP	Ott
Compulsory Elective Courses (Election: 1 item)			
T-WIWI-114178	HR-Management 2: Organization, Fairness & Leadership	4,5 CP	Nieken
T-WIWI-109121	Macroeconomic Theory	4,5 CP	Brumm
T-WIWI-102739	Public Revenues	4,5 CP	Wigger
T-WIWI-100005	Competition in Networks	4,5 CP	Mitusch

Assessment
The module examination takes place in the form of examinations (§4(2),1 SPO) of the selected partial module performance. The examination is carried out separately for each partial module and is described there. It is possible to repeat examinations at any regular examination date.

The grades of the partial module correspond to the grades of the passed examinations. The overall grade of the module is formed from the grades of the partial performances weighted with LP.

Prerequisites
The course "Introduction to Economic Policy" is mandatory in the module.

Competence Goal
Students shall be given the ability to

- understand and deepen basic concepts of micro- and macroeconomic theories
- apply those theories to economic policy issues
- understand government interventions in the market and their legitimation from the perspective of economic welfare
- learn how theory-based policy recommendations are derived

Content

- Intervention in the market: micro-economic perspective
- Intervention in the market: macroeconomic perspective
- Institutional economic aspects
- Economic policy and welfare economics
- Carriers of economic policy: political-economic aspects

Workload
Total effort for 9 credit points: approx. 270 hours. The distribution is made according to the credit points of the courses of the module.

Recommendations
Basic knowledge of micro- and macroeconomics is strongly recommended, as taught in the courses Economics I [2610012], and Economics II [2600014].

M 6.14 Module: Economic Theory [M-WIWI-101501]

Coordinators: Prof. Dr. Clemens Puppe
Organisation: KIT Department of Business and Economics
Part of: Economics (Specialisation Program Economics)
Compulsory Elective Modules (Economics)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	German/English	3	5

Compulsory Elective Courses (Election:)			
T-WIWI-102609	Advanced Topics in Economic Theory	4,5 CP	Brumm, Mitusch
T-WIWI-114598	Digital Markets and Mechanisms	4,5 CP	Rosar
T-WIWI-102892	Economics and Behavior	4,5 CP	Mill
T-WIWI-102850	Introduction to Game Theory	4,5 CP	Puppe, Reiß
T-WIWI-102844	Industrial Organization	4,5 CP	Reiß
T-WIWI-109121	Macroeconomic Theory	4,5 CP	Brumm
T-WIWI-102610	Welfare Economics	4,5 CP	Puppe

Assessment
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
None

Competence Goal
Students

- master concepts that are central to (micro-)economic theory and are familiar with their real-world applications,
- will be able to interpret and critically assess microeconomic models,
- attain in-depth knowledge of the theory of strategic decision making and of general equilibrium models,
- can apply methods from welfare economics to analyze issues like distributional fairness and equality of opportunity.

Content
The module covers central concepts in microeconomic theory as well as their applications. This includes an in-depth introduction to the modelling language and the equilibrium concepts (Nash equilibrium, sub-game-perfect Nash equilibrium, etc.) of non-cooperative game theory ("Introduction to Game Theory") as well as its applications to problems of imperfect competition and industrial organization ("Industrieökonomie") and the design of auctions and (incentive-)mechanisms ("Auction & Mechanism Design").

A further focus of the module is on the development of a micro-founded general equilibrium model in order to examine key macroconomic issues such as public dept and labor market as well as monetary policies ("Macroeconomic Theory"). Students may also delve deeper into the basics of behavioral economics and experimental design ("Economics & Behavior") as well as into questions of equality of opportunity and the fairness and efficiency of economic allocations ("Wohlfahrtstheorie").

Additional Information
Please note that the course T-WIWI-102609 "Advanced Topics in Economic Theory" is currently not available.

Workload
The total workload for this module is approximately 270 hours (9 credit points). The distribution is done according to the credit points of the courses of the module. The workload for courses with 4.5 credit points is approx. 135 hours. The total number of hours per course is calculated from the time required for attending lectures and exercises, as well as examination times and the time required for an average student to achieve the learning objectives of the module.

Recommendations
None

M 6.15 Module: eFinance [M-WIWI-101402]

Coordinators: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Business and Economics
Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	German/English	3	9

Mandatory			
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CP	Weinhardt
Supplementary Courses (Election: at least 4,5 credits)			
T-WIWI-102643	Derivatives	4,5 CP	Uhrig-Homburg
T-WIWI-112694	FinTech	4,5 CP	Thimme
T-WIWI-102646	International Finance	3 CP	Uhrig-Homburg

Assessment
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
The course *eFinance: Information Systems for Securities Trading* [2540454] is compulsory and must be examined.

Competence Goal
The students

- are able to understand and analyse the value creation chain in stock broking,
- are able to adequatly identify, design and use methods and systems to solve problems in finance,
- are able to evaluate and criticize investment decisions by traders,
- are able to apply theoretical methods of econometrics,
- learn to elaborate solutions in a team.

Content
The module "eFinance" addresses current problems in the finance sector. It is investigated the role of information and knowledge in the finance sector and how information systems can solve or extenuate them. Speakers from practice will contribute to lectures with their broad knowledge. Core courses of the module deal with the background of banks and insurance companies and the electronic commerce of stocks in global finance markets. In addtion the course Derivatives offers an insight into future and forward contracts as well as the assesment of options. Exchanges and International Finance are also alternatives which provide a suplementary understanding for capital markets.
Information management topics are the focus of the lecture "eFinance: Information Systems for Securities Trading". For the functioning of the international finance markets, it is necessary that there is an efficient information flow. Also, the regulatory frameworks play an important role. In this context, the role and the functioning of (electronic) stock markets, online brokers and other finance intermediaries and their platforms are presented. Not only IT concepts of German finance intermediaries are presented, but also international system approaches will be compared. The lecture is supplemented by speakers from the practice (and excursions, if possible) coming from the Deutsche Börse and the Stuttgart Stock Exchange.

Additional Information
The current seminar courses for this semester, which are complementary to this module, are listed on following webpage: the http://www.iism.kit.edu/im/lehre

Workload
The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

M 6.16 Module: Electives in Informatics [M-WIWI-101426]

Coordinators: Dr.-Ing. Tobias Käfer
Prof. Dr. Andreas Oberweis
Prof. Dr. Melanie Volkamer

Organisation: KIT Department of Business and Economics

Part of: Compulsory Elective Modules (Informatics)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	3	16

Compulsory Elective Area (Election: between 1 and 2 items)			
T-WIWI-110340	Applied Informatics – Applications of Artificial Intelligence	4,5 CP	Käfer
T-WIWI-114156	Applied Informatics – Cybersecurity	4,5 CP	Volkamer
T-WIWI-110341	Applied Informatics – Database Systems	4,5 CP	Oberweis
T-WIWI-113957	Applied Informatics – Mobile Computing	4,5 CP	Schiefer
T-WIWI-110338	Applied Informatics – Modelling	4,5 CP	Fritsch, Oberweis
T-WIWI-110711	Supplement Applied Informatics	4,5 CP	Professorenschaft des Instituts AIFB
Advanced Labs (Election: at most 1 item)			
T-WIWI-111127	Advanced Lab Blockchain Hackathon (Bachelor)	4,5 CP	Sunyaev
T-WIWI-111124	Advanced Lab Sociotechnical Information Systems Development (Bachelor)	4,5 CP	Sunyaev
T-WIWI-110541	Advanced Lab Informatics (Bachelor)	4,5 CP	Professorenschaft des Instituts AIFB
T-WIWI-114597	Advanced Lab Programming 3	4,5 CP	Oberweis
T-WIWI-112915	Advanced Lab Realization of Innovative Services (Bachelor)	4,5 CP	Oberweis
T-WIWI-108439	Advanced Lab Security, Usability and Society	4,5 CP	Volkamer

Assessment
The assessment is carried out as two partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

When every singled examination is passed, the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
None

Competence Goal
The student

- knows and has mastered methods and systems for core topics and core application areas of computer science,
- can choose these methods and system situation adequately and can furthermore design and employ them for problem solving,
- is able to independently find strategic and creative answers in the finding of solutions to well defined, concrete, and abstract problems.

Content
The elective module conveys advanced knowledge in the area of applied computer science. This includes, for example, the efficient design and optimization of technical systems, the design and management of database applications or the systematic development of large software systems. Moreover, modeling of complex systems, the use of computer science methods to support knowledge management, and the design and implementation of service-oriented architectures are discussed in this module.

Workload

Total workload for 9 credit points: approx. 270 hours

The exact distribution is based on the credit points of the courses in the module.

M 6.17 Module: Electric Energy Systems and Power Generation [M-ETIT-106821]

Coordinators: Prof. Dr.-Ing. Marc Hiller
Dr.-Ing. Bernd Hoferer
Prof. Dr.-Ing. Thomas Leibfried

Organisation: KIT Department of Electrical Engineering and Information Technology

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each summer term	1 term	German	3	2

Mandatory			
T-ETIT-101924	Power Generation	3 CP	Hoferer
T-ETIT-112850	Electric Energy Systems	6 CP	Hiller, Leibfried

Assessment
Electric Energy Systems:
Success control takes place in the form of a written examination lasting 120 minutes.

Power Generation:
Success control takes place in the form of an overall oral examination (approx. 20 minutes) on the selected course.

Prerequisites
none

Competence Goal
Electric Energy Systems:
Students learn about the main types of electrical machines. They can explain how they work and are able to calculate the operating behavior of electrical machines on the basis of simple models and using the electrical engineering basics they have already learned in the field of alternating current theory.

In addition, students learn about the most important self-controlled power converter circuits for energy and drive applications. This also includes the basic properties of the most important power semiconductors, whereby students are able to describe their behavior using characteristic curves and simple models.

Students will be able to analyze network feedback and the effect of power converters on the electrical machine. They can also recognize the components in energy transmission and drive systems and describe their function. Furthermore, they can calculate the behavior of the system components by coupling the models of the power converter, grid and machine.

Students will also be able to assess the role that power electronics will play in a sustainable energy supply and which technologies are crucial for a sustainable conversion and expansion of the electrical energy supply.

Students learn about the structure of the electrical energy supply network in Europe and especially in Germany. They know the laws of high-voltage direct current and high-voltage three-phase current transmission and can name the respective advantages and disadvantages and know the respective characteristics of active and reactive power transmission and the resulting technical consequences. Students will be familiar with the grid operating equipment, its structure and its mode of operation in the grid and will be able to carry out calculations with regard to the parameters important for grid operation. They will be able to name and calculate important design guidelines and operating characteristics of grid equipment. Using transformers as an example, they can carry out a basic design.

Power Generation:
Students are able to recognize energy technology problems and develop solutions. They have gained an understanding of the physical and theoretical relationships in energy technology. They are also able to describe, analyze and explain the developed solutions in a scientific format.

Content

Electric Energy Systems:

Part Hiller:
In this basic lecture, the section on drive technology and power electronics begins by explaining the mode of operation and operating behavior of the most important electrical machines. The focus is on rotary field machines (asynchronous machines, electrically and permanently excited synchronous machines, synchronous reluctance machines).

The most important power semiconductor components and their basic function are then presented. Building on this, the essential power converter circuits for applications in energy and drive technology (including electromobility) are presented. Their function and operating behavior are described.

In addition, the mode of operation and areas of application of electrical machines and power electronic circuits for grid and drive applications are explained in more detail using practical examples.

Part Leibfried:
The lecture begins with an introduction to the structure of the electrical power supply system and the basics of power calculation in the three-phase system. Furthermore, the basic laws for the transmission of electrical energy with direct and alternating current (high-voltage direct current transmission, HGÜ) and high-voltage three-phase current transmission, HDÜ) are dealt with. Another large chapter deals with electrical grid equipment such as generators, transformers, current and voltage transformers, capacitive and inductive compensators as well as overhead lines and cables.

Power Generation:
Basic lecture on the generation of electrical energy. From the conversion of the earth's primary energy resources in coal-fired power plants and in nuclear power plants to the use of renewable energies, the lecture covers the entire spectrum of generation. The lecture provides an overview of the physical principles, the technical and economic aspects and the development potential of generating electrical energy from both conventional and renewable sources.

Module Grade Calculation

The module grade is calculated from the average value of the written and oral examinations weighted according to CP.

Additional Information

"Erzeugung elektrischer Energie" will take place again in summer term 2026.

Workload

Electric Energy Systems:

- Attendance time in VL and Ü (4 SWS a 15 h): 4 * 15 h = 60 h
- Preparation/follow-up of the lecture: 14 * 2 h = 28 h
- Preparation/follow-up of the exercise: 14 * 2 h = 28 h
- Exam preparation: = 60 h
- Examination time: = 2 h
- **Total: 178 h = 6 LP**

Power Generation:

- Attendance time: 30 h
- Self-study time: 60 h
- **Total 90 h = 3 LP**

M 6.18 Module: Electrical Engineering [M-ETIT-101155]

Coordinators: Dr.-Ing. Matthias Brodatzki
Dr. Wolfgang Menesklou

Organisation: KIT Department of Electrical Engineering and Information Technology

Part of: Engineering Sciences (mandatory)

Credits	Grading	Recurrence	Duration	Level	Version
3 CP	graded	Each winter term	1 term	3	1

Mandatory			
T-ETIT-100533	Electrical Engineering for Business Engineers, Part I	3 CP	Brodatzki

Assessment
The assessment takes place in the form of a written examination lasting 90 min.

Competence Goal
The student knows and understands basic terms of electrical engineering and should be able to carry out simple calculations of DC and AC circuits.

Content
Supporting the lecture, assignments to the curriculum are distributed. These are solved into additional (voluntary) tutorials.

Module Grade Calculation
The module grade is the grade of the written exam.

Workload
See German version.

6.19 Module: Emphasis in Fundamentals of Engineering [M-MACH-101261]

Coordinators: Prof. Dr.-Ing. Alexander Fidlin
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Level	Version
9 CP	graded	Each term	1 term	4	2

Specialization in Fundamentals of Engineering (Election: at least 9 credits)			
T-ETIT-100534	Electrical Engineering for Business Engineers, Part II	5 CP	Brodatzki
T-MACH-102079	Material Science II for Business Engineers	5 CP	Wagner
T-MACH-102210	Introduction to Engineering Mechanics II : Dynamics	5 CP	Fidlin

Assessment
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations take place at the beginning of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is removed from the average of the partial examinations, with at least two partial exams need to be.

Competence Goal
Students acquire and deepen skills in engineering fundamentals and can apply them to technical problems. Specific teaching objectives are agreed with the respective coordinator of the course.

Content
The module content depends on the elected courses.

Additional Information
Starting winter term 2016/1017 the course "Introduction to Engineering Mechanics II : Dynamics" [2162276] will be held in winter term.

Workload
See German version.

M 6.20 Module: Emphasis Materials Science [M-MACH-101262]

Coordinators: Dr.-Ing. Wilfried Liebig
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German	4	4

Specialization Materials Science (Election: at least 9 credits)			
T-MACH-102141	Constitution and Properties of Wearresistant Materials	4 CP	Ulrich
T-MACH-105179	Functional Ceramics	4 CP	Botros
T-MACH-100287	Introduction to Ceramics	6 CP	Pagnan Furlan
T-MACH-102102	Physical Basics of Laser Technology	5 CP	Schneider
T-MACH-102137	Polymer Engineering I	4 CP	Liebig
T-MACH-102138	Polymer Engineering II	4 CP	Liebig
T-MACH-102157	High Performance Powder Metallurgy Materials	4 CP	Schell
T-MACH-112106	Fatigue of Materials	4 CP	Guth
T-MACH-102170	Structural and Phase Analysis	4 CP	Wagner
T-MACH-100531	Systematic Materials Selection	4 CP	Dietrich, Schulze
T-MACH-102139	Failure of Structural Materials: Fatigue and Creep	4 CP	Gruber, Gumbsch
T-MACH-102140	Failure of Structural Materials: Deformation and Fracture	4 CP	Gumbsch, Weygand
T-MACH-102079	Material Science II for Business Engineers	5 CP	Wagner

Assessment
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations take place at the beginning of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

Prerequisites
None

Competence Goal
Students acquire and deepen skills in fundamentals of materials science and engineering and can apply them to technical problems. Specific teaching objectives are agreed with the respective coordinator of the course.

Content
The module content depends on the elected courses.

Module Grade Calculation
The overall grade of the module is removed from the average of the partial examinations, with at least two partial exams need to be.

Workload
The module requires an average workload of 270 hours.

Teaching and Learning Methods
Lecture, Tutorial.

6.21 Module: Energy Economics [M-WIWI-101464]

Coordinators: Prof. Dr. Wolf Fichtner
Organisation: KIT Department of Business and Economics
Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	3	4

Mandatory			
T-WIWI-102746	Introduction to Energy Economics	5,5 CP	Fichtner
Supplementary Courses (Election: 3,5 credits)			
T-WIWI-102607	Energy Policy	3,5 CP	Wietschel
T-WIWI-100806	Renewable Energy-Resources, Technologies and Economics	3,5 CP	Jochem

Assessment
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) about the lecture *Introduction into Energy Economics* [2581010] and one optional lecture of the module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
The lecture *Introduction into Energy Economics* [2581010] has to be examined.

Competence Goal
The student

- is able to understand interdependencies in energy economics and to evaluate ecological impacts in energy supply,
- is able to assess the different energy carriers and their characteristics,
- knows the energy political framework conditions,
- gains knowledge about new market-based conditions and the cost and potentials of renewable energies in particular.

Content
Introduction to Energy Economics: Characterisation (reserves, suppliers, cost, technologies) of different energy carriers (coal, gas, oil, electricity, heat etc.)

Renewable Energy - Resources, Technology and Economics: Characterisation of different renewable energy carriers (wind, solar, hydro, geothermal etc.)

Energy Policy: Management of energy flows, energy-political targets and instruments (emission trading etc.)

Additional Information
Additional study courses (E.g. from other universities) can be transferred to the grade of the module on special request at the institute.

Workload
The total workload for this module is approx. 270 hours (9 credits). The allocation is based on the credit points of the courses in the module. The workload for courses with 3.5 credits is approx. 105 hours, for courses with 5.5 credits approx. 165 hours.
The total number of hours per course is calculated from the time required to attend the lectures and exercises, as well as the examination times and the time required for an average student to achieve the learning objectives of the module for an average performance.

Recommendations
The courses are conceived in a way that they can be attended independently from each other. Therefore, it is possible to start the module in winter and summer term.

M 6.22 Module: Engineering Mechanics [M-MACH-101259]

Coordinators: Prof. Dr.-Ing. Alexander Fidlin
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (mandatory)

Credits	Grading	Recurrence	Duration	Language	Level	Version
3 CP	graded	Each winter term	1 term	German	3	2

Mandatory			
T-MACH-102208	Introduction to Engineering Mechanics I: Statics and Strength of Materials	3 CP	Fidlin

Assessment
The assessment consists of a written examination taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination takes place in every semester. Re-examinations are offered at eyery ordinary examination date.

Permitted utilities: non-programmable calculator, literature

Prerequisites
None

Competence Goal
Professional competences:

Students will

- know and understand the basic elements of statics;
- be able to carry out simple static calculations on their own;
- know the basic concepts of strength theory: stress, strain and their relationship within the framework of elementary elasticity theory;
- know the most common strength hypotheses;
- be able to calculate independently rods, shafts and beams;
- know the classical cases of stability loss in compressed beams.

Interdisciplinary competences:

Students are familiar with analytical procedures and problem-oriented thinking. They are aware of the complexity of engineering problems and are able to identify and focus on the key issues within them. Students are able to use their acquired knowledge theoretical analysis of practically relevant engineering problems and to develop approaches to their solution.

Content
Statics: force • moment • general equilibrium conditions • center of gravity • inner forces in structure • plane frameworks • adhesion

Additional Information
Starting summer 2016 the course "Introduction to Engineering Mechanics I : Statics and Strength of Materials" [2162238] will be held in summer term.

Workload
The total workload for this module is approximately 90 hours

Teaching and Learning Methods
Lecture and exercises

6.23 Module: Entrepreneurial Thinking and Action: Fundamentals of Entrepreneurship [M-WIWI-107451]

Coordinators: Prof. Dr. Orestis Terzidis
Organisation: KIT Department of Business and Economics
Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	3	1

Compulsory Elective Courses (Election:)			
T-WIWI-114637	Entrepreneurship Basics	4,5 CP	Terzidis
T-WIWI-114636	Student2Startup	4,5 CP	Terzidis
T-WIWI-114635	SIL-LaunchLab	9 CP	Terzidis

Assessment
The assessment of success takes place in the form of partial examinations on the courses of the module amounting to a total of 9 CP. The assessment is described for each course in this module.

The overall grade of the module is calculated from the grades of the partial examinations weighted with credit points and cut off after the first decimal place.

Prerequisites
None

Competence Goal
Students will:

- experience experiential learning by independently developing solutions to entrepreneurial challenges, reflecting on them, and understanding the underlying theoretical concepts,
- acquire knowledge about developing and implementing business ideas,
- apply methods such as Lean Startup, Business Model Canvas, and Prototyping,
- analyze real-world problems faced by customers, users, or startups,
- collaboratively develop innovative solutions in teams,
- practice entrepreneurial thinking in a hands-on environment,
- improve their skills in teamwork, communication, and project management.

Content
This module teaches entrepreneurial thinking and action in a project-based and practice-oriented format. In interdisciplinary teams, students tackle real-world challenges and go through key phases of the entrepreneurial process:

In **Entrepreneurship Basics**, participants independently develop a business idea, validate customer needs, and test solutions using modern innovation tools (e.g., Value Proposition Canvas, Business Model Canvas, Rapid Prototyping).

In **Student2Startup**, students collaborate with real pre-seed startups to solve current strategic challenges in teams, supported by experts from the field.

In the **SIL LaunchLab**, students develop solutions for real technical or entrepreneurial challenges proposed by participants from the Student Innovation Lab (SIL). The goal is to contribute to the implementation and potential spin-off of these projects through innovative input.

The module fosters both analytical and creative thinking, collaborative work, and entrepreneurial practice in a real-world setting.

Workload
Total workload for 9 ECTS credits: approx. 270 hours. The workload is distributed according to the credit points assigned to each course in the module.

Recommendations
An interest in entrepreneurial thinking and action, teamwork, and interdisciplinary project work is recommended. Basic knowledge in business administration and/or innovation methods is helpful but not required.

6.24 Module: Essentials of Finance [M-WIWI-101435]

Coordinators: Prof. Dr. Martin Ruckes
Prof. Dr. Marliese Uhrig-Homburg

Organisation: KIT Department of Business and Economics

Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each summer term	1 term	German	3	3

Mandatory			
T-WIWI-102605	Financial Management	4,5 CP	Ruckes
T-WIWI-102604	Investments	4,5 CP	Uhrig-Homburg

Assessment
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
None

Competence Goal
The student

- has fundamental skills in modern finance
- has fundamental skills to support investment decisions on stock, bond and derivative markets
- applies concrete models to assess investment decisions on financial markets as well as corporate investment and financing decisions.

Content
The module *Essentials of Finance* deals with fundamental issues in modern finance. The courses discuss fundamentals of the valuation of stocks. A further focus of this module is on modern portfolio theory and analytical methods of capital budgeting and corporate finance.

Workload
The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

M 6.25 Module: Extracurricular Module in Engineering [M-WIWI-101404]

Coordinators: Prüfungsausschuss der KIT-Fakultät für Wirtschaftswissenschaften
Organisation: KIT Department of Business and Economics
Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Level	Version
9 CP	graded	Once	1 term	3	5

Compulsory Elective Courses (Election: between 9 and 12 credits)			
T-WIWI-106291	PH APL-ING-TL01	3 CP	
T-WIWI-106292	PH APL-ING-TL02	3 CP	
T-WIWI-106293	PH APL-ING-TL03	3 CP	
T-WIWI-106294	PH APL-ING-TL04 ub	0 CP	
T-WIWI-106295	PH APL-ING-TL05 ub	0 CP	
T-WIWI-106296	PH APL-ING-TL06 ub	0 CP	
T-WIWI-108384	PH APL-ING-TL07	3 CP	

Assessment
The assessment of the module is determined by the respective module corrdinator. It can either be in the form of a general exam or partial exams, and must contain at least 9 credit points (max. 12 credits) and at least 6 hours per week (max. 8 hours per week). The examination may contain presentations, experiments, laboratories, term papers, etc. At least 50 percent of the module examination has to be in the form of a written or an oral examination (according to Section 4 (2), 1 or 2 of the examination regulation).

The formation of the overall grade of the module will be determined by the respective module coordinator.

Prerequisites
The current regulations and guidance on the procedure for applying for an extracurricular module in engineering are explained in detail at https://www.wiwi.kit.edu/APIng-Modul.php.

Competence Goal
Through the extracurricular engineering module, the student is able to deal with technical topics and issues in depth.

The concrete learning objectives are coordinated with the respective module supervisor of the module.

Workload
The total workload for this module is about 270 hours (9 credits). The distribution is based on the credit points of the courses completed as part of the module.

M 6.26 Module: Financial Data Science [M-WIWI-105610]

Coordinators: Prof. Dr. Maxim Ulrich
Organisation: KIT Department of Business and Economics
Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each summer term	1 term	English	3	2

Mandatory			
T-WIWI-111238	Financial Data Science	9 CP	Ulrich

Assessment
The module examination takes the form of an examination of a different type (see partial performance description for details).

Prerequisites
None

Competence Goal
The primary objective of this course is to introduce students to data-driven financial analysis and equip them with a broad set of machine learning techniques for capital markets. The program begins with practical MBA-style case studies on fundamental finance concepts, ensuring that all participants—regardless of prior finance knowledge—establish a strong foundational understanding. In parallel, students develop essential Python programming and data handling skills (e.g., with Pandas, Statsmodels, and scikit-learn).

Building on these fundamentals, the course covers key topics such as forecasting equity and option returns, option pricing (e.g., the Black-Scholes model), and advanced portfolio construction techniques, including distributionally robust optimization and end-to-end reinforcement learning. By integrating financial theory with sophisticated data science methods, students learn to address complex challenges in risk management and empirical asset pricing. Upon completion, they will be able to apply state-of-the-art machine learning approaches to real-world financial data and meet the demands of a rapidly evolving, data-centric financial industry.

Content
This course offers a blend of financial fundamentals and modern data analysis. The content is structured as follows:

- Introduction to Finance
- Introduction to valuation concepts and portfolio theory
- Risk premiums and the CAPM
- Case studies for the practical application of financial theories
- Python Basics and Data Processing
- Efficient data management and cleaning
- Regression analyses and constrained optimization
- Introduction to essential libraries (e.g., NumPy, Pandas, PyTorch)
- Machine Learning in Finance
- Linear vs. non-linear prediction models
- Neural networks, random forests, and other ML methods
- Feature selection and out-of-sample performance
- Options and Volatility Analysis
- Construction and analysis of implied volatility structures
- ML-based option pricing and risk premium models
- Systematic vs. idiosyncratic risks
- Advanced ML Applications
- Deep learning for equity and option return forecasts
- Statistical arbitrage and end-to-end portfolio optimization
- Distributionally robust optimization
- Practical Examples and Case Studies
- Use of modern ML libraries (PyTorch, TensorFlow)
- Real-world datasets and empirical financial analysis
- Discussion of challenges (e.g., big data, computational effort)

Workload

The total workload for this module is approximately 270 hours (equivalent to 9 credit points). This workload includes:

1. Independent study of financial fundamentals (e.g., valuation, CAPM, portfolio theory) and preparation for case studies.
2. Programming exercises in Python (e.g., regression analyses, data cleaning, constrained optimization).
3. Weekly assignments and in-depth questions on the topics covered in class.
4. Preparation and follow-up of lectures, particularly using lecture notes, online videos, and recommended reading materials.
5. Project and case study work applying the learned material to real-world data.
6. Final exam preparation, revisiting essential concepts and practical programming skills.

M 6.27 Module: Financial Data Science in Practice [M-WIWI-107454]

Coordinators: Prof. Dr. Maxim Ulrich
Organisation: KIT Department of Business and Economics
Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	English	3	1

Mandatory			
T-WIWI-114633	Financial Data Science in Practice	9 CP	Ulrich

Assessment
The examination is structured as an alternative exam assessment and consists of the following components:

- **Interim Presentations (Formative Milestones)**
- **Quality of Implementation** (Reproducibility, Code Documentation, Tests)
- **Final Written Paper** (15 – 20 pages, scientific standard)
- **Final Presentation** (approx. 30 minutes, public research talk)

The overall grade is determined by the weighted evaluation of the individual components of this assessment. The exact weighting of these components for grade calculation will be announced at the beginning of the course.

Prerequisites
The course T-WIWI-111238 "Financial Data Science" must be passed.

Competence Goal
Students

- Select and apply modern ML / financial-data-science techniques to real-world problems,
- work effectively in agile, cross-functional teams,
- extend their technical skill-set and transfer it to live market data,
- solve a finance-oriented research question with DS/ML algorithms,
- document, present and defend their results to a specialist audience.

Content
Targeted at Bachelor students specialising in Data Science, Machine Learning or Quantitative Finance. Teams of 3 – 6 tackle a hands-on research question at the intersection of financial markets, data science and ML. Deliverables include a scientific report and a fully reproducible research codebase (Git). Data typically come from high-frequency prices, intraday options, ESG feeds, etc.

Projects are coached by KABFI PhD researchers; selected topics may be co-supervised by partner universities.

Additional Information
The language of instruction for this module is English. Project supervision can also be provided in German.

Workload
The total workload for this module is approximately 270 hours (equivalent to 9 credit points). This workload includes:

- Team communication & supervision: 30 hours
- Presentations: 10 hours
- Problem analysis & solution design: 70 hours
- Implementation: 110 hours
- Testing & QA: 50 hours
- Total: 270 hours

M 6.28 Module: Financing and Accounting [M-WIWI-105769]

Coordinators: Dr. Torsten Luedecke
Prof. Dr. Martin Ruckes
Prof. Dr. Marcus Wouters

Organisation: KIT Department of Business and Economics

Part of: Business Administration (mandatory)

Credits	Grading	Recurrence	Duration	Language	Level	Version
5 CP	graded	Each summer term	1 term	German	3	3

Mandatory			
T-WIWI-112820	Introduction to Finance and Accounting	5 CP	Luedecke, Ruckes, Wouters

Assessment
Written examination (2.5 hours). The examination takes place as part of the examination course "Financing and Accounting" and covers the content of the two courses "Introduction to Finance and Accounting" and "Annual Financial Statements and Valuation". The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible on every regular examination date.

Competence Goal
The student

- has basic knowledge in financial assessment of important business decisions and the functioning of financial markets,
- has an understanding of problems, interrelationships and solutions of internal accounting of companies,
- knows the structures and functions of external accounting,
- has an overview of important components of the annual financial statements of companies and is able to assess them economically.

With the knowledge acquired in the three basic business administration modules, the prerequisites are created in the area of business administration to expand this knowledge in the specialization program.

Content
The fundamentals for the financial analysis of important business decisions are taught. In addition, the fundamentals of internal and external accounting are laid and an introduction is given to accounting and the annual financial statements.

Workload
Total workload required for 5 credit points: approx. 150 hours

M 6.29 Module: Foundations of Informatics [M-WIWI-101417]

Coordinators: Dr.-Ing. Tobias Käfer
Prof. Dr.-Ing. Sanja Lazarova-Molnar
Organisation: KIT Department of Business and Economics
Part of: Informatics (mandatory)

Credits	Grading	Recurrence	Duration	Language	Level	Version
10 CP	graded	Each term	2 terms	German/English	3	1

Mandatory			
T-WIWI-102749	Foundations of Informatics I	5 CP	Käfer
T-WIWI-102707	Foundations of Informatics II	5 CP	Lazarova-Molnar

Assessment
The assessment is carried out as partial exams (according to Section 4(2), 1 and 3 of the examination regulation) of the individual courses of this module.

The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. For a successful module assessment both partial exams have to be passed.

- Foundations of Informatics I: Written exam in the first week of the recess period (60 min)
- Foundations of Informatics II: Written exam in the first week of the recess period (90 min). It is possible to gain 0,3-0.4 additional grading points for a passed exam by successful completion of a bonus exam.

When both partial exams are passed, the overall grade of the module is the average of the grades for each course weighted by the credit points and truncated after the first decimal.

Prerequisites
None

Competence Goal
The student

- knows the main principles, methods and systems of computer science,
- can use this knowledge for applications in advanced computer science courses and other areas for situation-adequate problem solving,
- is capable of finding strategic and creative responses in the search for solutions to well defined, concrete, and abstract problems.

The student can deepen the learned concepts, methods, and systems of computer science in advanced computer science lectures.

Content
This module conveys knowledge about modeling, logic, algorithms, sorting and searching algorithms, complexity theory, problem specifications, and data structures. From the field of theoretical computer science, formal models of automata, languages and algorithms are presented and applied to the architecture of computer systems.

Workload
The total workload for this module is approximately 300 hours.

Recommendations
It is strongly recommended to attend the courses of the core program in the following sequence: *Introduction to Programming with Java*, *Foundations of Informatics I*, *Foundations of Informatics II*

6.30 Module: Foundations of Marketing [M-WIWI-101424]

Coordinators: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Business and Economics
Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	3	9

Mandatory			
T-WIWI-102805	Managing the Marketing Mix	4,5 CP	Klarmann
Supplementary Courses (Election: at least 4,5 credits)			
T-WIWI-111367	B2B Sales Management	4,5 CP	Klarmann
T-WIWI-112156	Brand Management	4,5 CP	Kupfer
T-WIWI-114292	Consumer Psychology	4,5 CP	Scheibehenne

Assessment
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
The course *Marketing Mix* is compulsory and must be examined.

Competence Goal
The aim of this module is to prepare students for a job in marketing or sales. Especially in technically oriented companies, employees who have a certain technical background as industrial engineers or business informatics specialists are often fit for this purpose.
Students

- are familiar with the most important concepts, procedures and theories of the four instruments of the marketing mix (product management, price management, communication management and sales management)
- have the knowledge to make decisions regarding current and future products (product innovations, e.g. by using conjoint analysis)
- know how customers perceive brands and how this perception can be influenced by the company
  understand how customers react to prices (e.g. using price-sales functions)
- can determine prices on the basis of conceptual and quantitative considerations
  know the basics of price differentiation
- are familiar with various communication instruments (e.g. TV advertising) and can design them accurately
- make communication decisions systematically (e.g. by means of media planning)
- can segment the market and position the product
- know how to assess the importance and satisfaction of customers.

Additionally when taking the course "B2B Sales Management":

- can shape the relationship with customers and sales partners and know the basics of sales organization as well as essential sales channel decisions
- know about specifics of marketing in B2B
- are able to identify different B2B business types and their peculiarities in marketing and sales
- are able to prioritize customers and calculate B2B customer lifetime value
- are able to determine value-based prices and prepare and conduct B2B sales presentations.

Additionally when taking the course "Consumer Behavior":

- know about the influences of social factors, neuronal processes and cognitive resources on consumer behavior
- know about the influences of evolutionary factors, emotions, individual differences and motivation on consumer behavior.

Content

The core course of the module is “Marketing Mix”. This course is compulsory and must be examined. “Marketing Mix” contains instruments and methods that enable you to goal-oriented decisions in the operative marketing management (product management, pricing, promotion and sales management). In the "B2B Sales Management" course, we impart knowledge about marketing and sales in environments in which companies themselves distribute and market (often technically highly complex) products to other companies ("business-to-business"). In the "Consumer Behavior" course, we provide an understanding of situational, biological, cognitive, and evolutionary factors that influence consumer behavior. This understanding is provided from an interdisciplinary perspective, incorporating relevant theories and empirical research findings from psychology, cognitive science, biology, and economics.

Additional Information

The courses "Services Marketing and B2B Marketing" and "International Marketing" were offered for the last time in the winter semester 2020/21 and will be replaced by the course "B2B Sales Management" from the winter semester 2021/22 on. The course "Marketing Mix" will continue to be offered as normal in the summer semester 2021 and will also be retained in the long term.
For further information please contact the Marketing & Sales Research Group (marketing.iism.kit.edu).

Workload

Total effort for 9 credit points: approx. 270 hours.
The exact distribution is done according to the credit points of the courses of the module.

M 6.31 Module: Fundamentals of Construction [M-BGU-101004]

Coordinators: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	German	3	3

Mandatory			
T-BGU-101691	Construction Technology	6 CP	Haghsheno
T-BGU-113454	Examination Prerequisite Project Management	0 CP	Haghsheno
T-BGU-113720	Project Management	3 CP	Haghsheno

Assessment
- module component T-BGU-101691 with written examination according to § 4 Par. 2 No. 1
- module component T-BGU-113454 with not graded coursework according to § 4 Par. 3 as examination prerequisite to module component T-BGU-101675
- module component T-BGU-113720 with examination of another type according to § 4 Par. 2 No. 3

details about the learning controls, see module components

Prerequisites
none

Competence Goal
The student

- is familiar with all substantial domains of construction
- knows and understands substantial construction methods and construction machines
- masters basic construction calculations
- knows and understands the basics and purpose of professional construction project management
- can describe the relevant areas of knowledge and competence elements in construction project management
- can describe the typical course of a project and explain how a construction project is organized by construction project management
- can apply the knowledge acquired in construction operations engineering and project management in a targeted manner for corresponding situations in construction projects.

Content
This module introduces methods and procedures from all areas of construction operations. This includes production planning and control as well as essential parts of building construction and civil engineering process engineering, including auxiliary operations. In addition to the explanation of various machines, equipment and processes and the relevant basic knowledge, performance calculations are also carried out, for example. Further, there is an introduction to the basics of construction project management. Competence elements according to ICB4 in the areas of context, methods and people as well as selected project management methods are taught.

Module Grade Calculation
grade of the module is CP weighted average of grades of the partial exams

Additional Information
<u>IMPORTANT:</u>

As from winter term 2025/26 an examination prerequisite and the written examination Project Management will be replaced by an examination of another type.

We encourage students to deepen their knowledge in construction by building additional customized modules from the courses offered by TMB. Please consult with the tutors of this module. Further information is available at www.tmb.kit.edu.

Workload
contact hours (1 HpW = 1 h x 15 weeks):

- Construction Technology lecture, exercise: 60 h
- Project Management lecture/exercise: 30 h

independent study:

- preparation and follow-up lectures, exercises Construction Technology: 45 h
- examination preparation Construction Technology (partial examination): 75 h
- preparation and follow-up lecture/exercises Project Management: 10 h
- preparation of online tests Project Management (not graded examination prerequisite): 5 h
- preparation opf term paper to Project Management (part of partial examination): 30 h
- examination preparation online test Project Management (part of partial examination): 15 h

total: 270 h

Recommendations
None

6.32 Module: Fundamentals of Digital Service Systems [M-WIWI-102752]

Coordinators: Prof. Dr. Gerhard Satzger
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Business and Economics

Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	English	3	7

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-111307	Digital Services: Foundations	4,5 CP	Holtmann
T-WIWI-109816	Foundations of Interactive Systems	4,5 CP	Mädche
T-WIWI-110888	Practical Seminar: Digital Services	4,5 CP	Satzger

Assessment
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO), whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
None

Competence Goal
Students

- understand services from different perspectives and the concept of value creation in service networks
- know about the concepts, methods and tools for the design, modelling, development and management of digital services and are able to use them
- understand the basic characteristics and effects of integrated information system as a an integral element of digital services
- gain experience in group work as well as in the analysis of case studies and the professional presentation of research results
- practice skills in the English language in preparation of jobs in an international environment

Content
Global economy is increasingly determined by services: in industrialized countries nearly 70% of gross value added is achieved in the tertiary sector. Unfortunately, for the design, development and the management of services traditional concepts focused on goods are often insufficient or inappropriate. Besides, the rapid technical advance in the information and communication technology sector pushesthe economic importance of digital services even further thus changing the competition environment. ICT-based interaction and individualization open up completely new dimensions of shared value between clients and providers, dynamic and scalable “service value networks” replace established value chains, digital services are provided globally crossing geographical boundaries. This module establishes a basis for further specialization in service innovation, service economics, service design, service modelling, service analytics as well as the transformation and coordination of service networks.

Additional Information
This module is part of the KSRI teaching profile “Digital Service Systems”. Further information on a service-specific profiling is available under www.ksri.kit.edu/teaching.

Workload
Total workload for 9 credit points: approx. 270 hours. The allocation is based on the credit points of the courses in the module.

Recommendations
None

6.33 Module: Handling Characteristics of Motor Vehicles [M-MACH-101264]

Coordinators: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	4	7

Vehicle Properties (Election: at least 9 credits)			
T-MACH-105152	Handling Characteristics of Motor Vehicles I	3 CP	Unrau
T-MACH-105153	Handling Characteristics of Motor Vehicles II	3 CP	Unrau
T-MACH-102156	Project Workshop: Automotive Engineering	4,5 CP	Frey, Gießler

Assessment
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
None

Competence Goal
The student

- knows and understands the characteristics of vehicles, owing to the construction and design tokens,
- knows and understands especially the factors being relevant for comfort and acoustics
- is capable of fundamentally evaluating and rating handling characteristics.

Content
See courses.

Workload
The total work load for this module is about 270 Hours (9 Credits). The partition of the work load is carried out according to the credit points of the courses of the module. The work load for courses with 4.5 credit points is about 135 hours, and for courses with 3 credit points about 90 hours. The total number of hours per course results from the time of visiting the lectures and exercises, as well as from the exam duration and the time that is required to achieve the objectives of the module as an average student with an average performance.

Recommendations
Knowledge of the content of the courses *Engineering Mechanics I* [2161238], *Engineering Mechanics II* [2162276] and *Basics of Automotive Engineering I* [2113805], *Basics of Automotive Engineering II* [2114835] is helpful.

M 6.34 Module: HR Management & Digital Workplace [M-WIWI-105928]

Coordinators: Prof. Dr. Alexander Mädche
Prof. Dr. Petra Nieken

Organisation: KIT Department of Business and Economics

Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	German/English	3	2

Elective Offer (Election:)			
T-WIWI-113745	HR-Management 1: HR Strategies in the Age of AI	4,5 CP	Nieken
T-WIWI-111858	Topics in Human Resource Management	3 CP	Nieken
T-WIWI-109816	Foundations of Interactive Systems	4,5 CP	Mädche
T-WIWI-111914	Practical Seminar: Interactive Systems	4,5 CP	Mädche

Assessment
The assessment is carried out as partial exams of the courses in this module. The assessment procedures are described for each course in the module separately.

The overall grade of the module is the average of grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
Please refer to the course descriptions for potential restrictions regarding an individual course.

Competence Goal
The student

- understands and analyses challenges and objectives within organizations
- applies economic models and empirical methods to analyze and solve challenges with a focus on the future of work
- understands the impact of digitalization and new information and communication technology on the work life and HR decisions
- knows how to apply scientific research methods and understands the underlying problems

Content
The module „HR Management & Digital Workplace" offers an interdisciplinary approach and brings together knowledge about Human Resource Management, Leadership and Digitalization. The module specifically focuses on topics related to the future of work in organizations. The topics range from interactive systems at the digital workplace and human-centered design, to recruiting, training and development, as well as (digital) leadership. All courses in the module foster active participation and allow students to learn state-of-the-art concepts and methods and apply them to real-world challenges.

Additional Information
Please refer to the course descriptions for potential restrictions regarding an individual course.

Workload
Total workload for 9 credits: approx. 270 hours.

M 6.35 Module: Industrial Production I [M-WIWI-101437]

Coordinators: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Business and Economics
Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	German/English	3	4

Mandatory			
T-WIWI-102606	Fundamentals of Production Management	5,5 CP	Schultmann
Supplementary Courses (Election: 3,5 credits)			
T-WIWI-102870	Logistics and Supply Chain Management	3,5 CP	Schultmann
T-WIWI-102820	Production Economics and Sustainability	3,5 CP	Schultmann

Assessment
The assessment is carried out as partial exams (according to section 4 (2), 1 SPO) of the core course “Fundamentals of Production Management” [2581950] and one further single course of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
The course “Fundamentals of Production Management” [2581950] and one additional activity have to be chosen.

Competence Goal

- Students shall be aware of the important role of industrial production and logistics for production management.
- Students shall use relevant concepts of production management and logistics in an adequate manner.
- Students shall be able to reflect on decision principles in firms and their circumstances in the light of the production management aspects studied.
- Students shall be proficient in describing essential tasks, difficulties and solutions to problems in production management and logistics
- Students shall be able to describe relevant approaches of modeling production and logistic systems.
- Students shall be aware of the important role of material and energy-flows in production systems.
- Students shall be proficient in using exemplary methods for solving selected problems.

Content
This module is designed to introduce students into the wide area of industrial production and logistics management. It focuses on strategic production management under the aspect of sustainability. The courses use interdisciplinary approaches of systems, also theory to describe the central tasks of industrial production management and logistics. Herein, attention is drawn upon strategic corporate planning, research and development as well as site selection. Students will obtain knowledge in solving internal and external transport and storage problems with respect to supply chain management and disposal logistics.

Workload
Total effort will account to 270 hours (9 credit points) and can be allocated according to the credit point rating. Therefore, a course with 3.5 credits requires an effort of approximately 105h and a course with 5.5 credits 165h.

The total effort for each course consists of attending lectures and tutorials, examination times and the time an average student needs to prepare himself in order to pass the exam with an average grade.

M 6.36 Module: Information Systems & Digital Business [M-WIWI-105981]

Coordinators: Prof. Dr. Alexander Mädche
Prof. Dr. Gerhard Satzger
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Business and Economics

Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	German/English	3	3

Compulsory Elective Courses (Election: at least 1 item)			
T-WIWI-111307	Digital Services: Foundations	4,5 CP	Holtmann
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CP	Weinhardt
T-WIWI-113746	Enterprise Systems for Financial Accounting & Controlling	4,5 CP	Fleig, Mädche
T-WIWI-109816	Foundations of Interactive Systems	4,5 CP	Mädche
T-WIWI-107506	Platform Economy	4,5 CP	Weinhardt
T-WIWI-114596	Sustainability in E-Business	4,5 CP	Heßler, Pfeiffer
Complementary Offer (Election: at most 1 item)			
T-WIWI-110888	Practical Seminar: Digital Services	4,5 CP	Satzger
T-WIWI-111914	Practical Seminar: Interactive Systems	4,5 CP	Mädche
T-WIWI-112154	Practical Seminar: Platform Economy	4,5 CP	Weinhardt

Assessment

The module examination takes place in the form of partial examinations via courses of the module amounting to a total of at least 9 LP.
The overall score of the module is formed from the credit-weighted scores of the partial examinations and truncated after the first decimal place.

Competence Goal

Students

- understand the basic concepts of interactive systems as well as the economic foundations and key components of platforms
- explore the theoretical grounding of interactive systems leveraging theories from reference disciplines such as psychology
- understand business models, network effects of digital platforms and get to know different market forms and market mechanisms
- gain experience in group work as well as in the analysis of case studies and the professional presentation of research results

Content

The “Information Systems & Digital Business” modules of the research groups of Prof. Dr. Alexander Mädche (Information Systems & Service Design), Prof. Dr. Gerhard Satzger (Digital Service Innovation) and Prof. Dr. Christof Weinhardt (Information & Market Engineering), offer a comprehensive overview on important topics of digitalization – blending aspects of digital interaction, digital services and the platform economy. Courses in this module cover the aspects of interaction between humans and information systems as well as the economic foundations of platform businesses:

Foundations of Interactive Systems:

Advanced information and communication technologies (ICT) make interactive systems ever-present in the users’ private and business life. They are an integral part of E-Commerce portals or social networking sites as well as at the workplace, e.g. in the form of collaboration portals or analytical dashboards. Furthermore, with the ever-increasing capabilities of ICT, the design of human-computer interaction is becoming increasingly important. The aim of this module is to introduce the foundations, related theories, key concepts, and design principles as well as current practice of contemporary interactive systems. The students get the necessary knowledge to guide the successful implementation of interactive systems in business and private life.

Platform Economy:

Apple, Alphabet, Amazon, Microsoft, and Facebook; five of the most valuable companies worldwide create large portions of their profits by employing a digital platform model. This module teaches the key design considerations of digital platforms: their foundations in economic theory, their core components and design aspects, the adequate selection of market mechanisms for achieving certain goals, and the role of user behavior in the context of digital platforms. The theoretic foundations are enriched by discussions of several real-world examples, e.g. from the finance sector. Thus, the students are enabled to a) analyze given platforms and make recommendations for improvements and b) independently design new platforms for given use cases.

Additional Information

The module can no longer be taken as of winter semester 2022/2023.

Workload

Total effort for 9 credit points: approx. 270 hours. The distribution is based on the credit points of the courses of the module (120-135h for courses with 4.5 credit points). The total number of hours per course results from the effort required to attend lectures and exercises, as well as the examination times and the time required to achieve the learning objectives of the module for an average student for an average performance.

6.37 Module: Integrated Production Planning [M-MACH-101272]

Coordinators: Prof. Dr.-Ing. Gisela Lanza
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each summer term	1 term	German	3	3

Mandatory			
T-MACH-109054	Integrated Production Planning in the Age of Industry 4.0	9 CP	Lanza

Assessment
Written Exam (120 min)

Prerequisites
none

Competence Goal
The students

- can discuss basic questions of production technology.
- are able to apply the methods of integrated production planning they have learned about to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about for a specific problem.
- can apply the learned methods of integrated production planning to new problems.
- can use their knowledge targeted for efficient production technology.

Content
Within this engineering sciences-oriented module the students will get to learn principle aspects of organization and planning of production systems.

Workload
regular attendance: 63 hours
self-study: 207 hours

Teaching and Learning Methods
Lecture, exercise, excursion

M 6.38 Module: Internship [M-WIWI-101419]

Coordinators: Studiendekan des KIT-Studienganges
Organisation: KIT Department of Business and Economics
Part of: Internship

Credits	Grading	Recurrence	Duration	Level	Version
10 CP	pass/fail	Once	1 term	3	2

Mandatory			
T-WIWI-102611	Internship	10 CP	Studiendekan des KIT-Studienganges

Assessment
The assessment is carried out by the evidence of completed full-time internships of at least 12 weeks with at least 20 working hours per week and a presentation of the internship in the form of a written report on the activities. The internship is not graded.

1. Information on evidence of completed full-time internships:

The internship is proofed by the certificate of the intern's office. The certificate has to be formally correct with official corporate letterhead and handwritten countersigned by a responsible employee of the company.

The certificate must at least contain the following information:

* Company / Location
* Duration: from ... to ...
* Hours of work (weakly)
* Working interruption, indicating the vacation and sick days
* Department
* Headwords to the activitis

2. Information on to the presentation:

The internship report should be at least one page (typewritten, not handwritten) for each Location. It must be countersigned by a representative of the intern's office.

Prerequisites
None

Competence Goal

- has general insight into the essential processes in a company,
- is in a position to identify operation correlations and has the knowledge and skills to facilitate a fast understanding of the processes in the company,
- in addition to practical professional experience and competences, also has key competences such as own initiative, ability to work in a team and communication skills as well as ability to integrate into corporate hierarchies and procedures,
- has the experience to accomplish complex IT and business tasks under realistic conditions within the framework of the relevant legal aspects and while applying the total acquired knowledge (interlaced thinking),
- has an idea of the professional development potential in the economy through pursuit of study-related activities,
- knows the technical and professional requirements in the individually targeted future occupation and can take this knowledge into account for the future planning of his/her studies and career,
- can assess and estimate own technical and professional strengths and weaknesses through his/her evaluation of the company.

Content

The internship may be done in economic, business and/or technical companies. At best, it is done on activities which are located at the intersection of the two fields - getting to know the specific requirements of Industrial Engineering and Management.

A commercial internship provides an insight into business or administrative processes of business transactions. Therefor departments such as controlling, organizing, marketing and planning appear particularly suitable.

Work experiences in the departments of engineering, work preparation and provision of material or IT cover more technical aspects of the internship. But work experiences in an engineering firm go with a technical internship.

It remains the companies and interns left, which stations and areas the intern will eventually go through. But the focus should always be in accordance with operational realities of the company.

Additional Information

Internships, that were completed even before studying may be recognized, if the criteria for recognition are met. After recognition of the compulsory internship, there can be taken a semester off for a voluntary, student-related internship.

Regarding to the election of the company, in which the internship is completed, there are no specific rules. With a view to the future professional career, it is recommended to absolve the internship in a larger, possibly international company.

Vacation days are not figured into the internship.

Only three sick leave days may incurred at all. Any additional sick days are not figured into the internship.

A relevant vocational education of at least two years is accepted as a performance equivalent to the internship.

Workload

The total workload for this module is approximately 300 hours.

M 6.39 Module: Introduction to Economics [M-WIWI-101398]

Coordinators: Prof. Dr. Clemens Puppe
Organisation: KIT Department of Business and Economics
Part of: Economics (mandatory)

Credits	Grading	Recurrence	Duration	Level	Version
10 CP	graded	Each term	2 terms	3	1

Mandatory			
T-WIWI-102708	Economics I: Microeconomics	5 CP	Puppe, Reiß
T-WIWI-102709	Economics II: Macroeconomics	5 CP	Wigger

Assessment
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module. The assessment procedures of each course of this module is defined for each course separately.

Competence Goal
The student

- knows and understands basic economic problems,
- understands economic policy in globalized markets,
- is able to develop elementary solution concepts.

The lectures of this module have different focuses: In Economics I, economic problems are seen as decision problems, Economics II treats the dynamics of economic processes.

Content
The basic concepts, methods and models of micro- and macroeconomics are treated. The course *Economics I: Microeconomics [2600012]* deals with micro-economic decision theory, questions of market theory and problems of imperfect competition and with basic principles of game theory and welfare economics. *Economics II: Macroeconomics [2600014]* discusses economic organization models and national accounts as well as the question of international trade and monetary policy. Furthermore, the complex growth, boom and economic speculations are dealed with.

Module Grade Calculation
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Additional Information
Notice: The lecture *Economics I: Microeconomics* [2600012] is part of the preliminary examination concerning § 8(1) of the examination regulation in the study programs Industrial Engineering and Management B.Sc. and Economics Engineering B.Sc.. This examination must be passed until the end of the examination period of the second semester. Any Re-examinations has to be passed until the end of the examination period of the third semester. Otherwise the examination claim will be lost.

Workload
See German version.

6.40 Module: Introduction to Natural Hazards and Risk Analysis [M-WIWI-104838]

Coordinators: apl. Prof. Dr. Michael Kunz
Organisation: KIT Department of Business and Economics
Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German	3	4

Compulsory Elective Courses (Election: at least 9 credits)			
T-BGU-101500	Introduction to Engineering Geology	5 CP	Blum
T-BGU-103541	Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite	3 CP	Wursthorn
T-BGU-101681	Introduction to GIS for Students of Natural, Engineering and Geo Sciences	3 CP	Wursthorn
T-BGU-101637	Systems of Remote Sensing, Prerequisite	1 CP	Cermak, Hinz, Weidner
T-BGU-101638	Procedures of Remote Sensing, Prerequisite	1 CP	Weidner
T-BGU-101636	Remote Sensing, Exam	4 CP	Cermak, Hinz, Weidner
T-BGU-103542	Procedures of Remote Sensing	3 CP	Weidner
T-PHYS-103525	Geological Hazards and Risk	8 CP	Schäfer
T-BGU-101693	Hydrology	4 CP	Zehe
T-PHYS-101092	Climatology	1 CP	Ginete Werner Pinto
T-BGU-101814	Project in Applied Remote Sensing	1 CP	Hinz, Weidner
T-PHYS-105594	Exam on Climatology	5 CP	Ginete Werner Pinto
T-BGU-101667	Hydraulic Engineering and Water Management	4 CP	Rodrigues Pereira da Franca

Assessment
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
There are no singular exams for Remote Sensing Systems [20241/42] and Remote Sensing Methods [20265/66]. Therefore it not possible to choose Remote Sensing [GEOD-BFB-1] and additionally the courses Remote Sensing Systems, Remote Sensing Methods or the project Angewandte Fernerkundung [20267] (because they are already included). See also “Recommendations".

Competence Goal
The student possesses

- knowledge of various extreme events (meteorological, hydrological, geophysical) and their characteristics and causes
- an improved understanding of natural disasters, their causes and effects from an interdisciplinary perspective
- knowledge of methods of early warning and/or prediction of extreme natural events, as well as possible prevention and precautionary measures.

Content
The courses in this module primarily deal with scientific and engineering aspects of extreme events and natural disasters. The overarching aim of the module is to gain a better understanding of risk as a complex interaction of different mechanisms and processes. Contributions from meteorology, geophysics and hydrology enable an interdisciplinary understanding of extreme events and disasters. The teaching of methodological knowledge (e.g. meteorological, hydrological or geophysical measurement methods) is of great importance. These also include methods of hazard analysis and forecasting and/or early warning with the aim of significantly reducing the exposure and vulnerability of people, critical infrastructure and technical or biological systems and thus the impact of extreme events.

Additional Information
As a precaution, we would like to point out that the lecture belonging to the "Climatology" [T-PHYS-101092] has the number 4051111 and is read by Mr. Pinto. The lecture of the same name by Mr. Hogewind (6111031) does not belong to this course and is not creditable in this module.

Information on the course "Geological Hazards and Risk":

Language: English

Content:

- Earthquake Hazards
  - Short introduction to seismology and seismometry (occurrence of tectonic earthquakes, types of seismic waves, magnitude, intensity, source physics)
  - Induced seismicity
  - Engineering seismology, Recurrence intervals, Gutenberg-Richter, PGA, PGV, spectral acceleration, hazard maps
  - Earthquake statistics
  - Liquefaction
- Tsunami Hazards
- Landslide Hazards
- Hazards from Sinkholes
- Volcanic Hazards
  - Short introduction to physical volcanology
  - Types of volcanic hazards
- The Concept of Risk, Damage and Loss
- Data Analysis and the use of GIS in Risk analysis
- Risk Modelling - Scenario Analysis
- Risk Reduction and Risk Management
- Analysis Feedback and Prospects in the Risk Modelling Industry

Learning outcomes:

The students understand basic concepts of hazard and risk. They can explain in detail different aspects of earthquake hazard, volcanic hazard as well as other geological hazards, can compare and evaluate those hazards. The have fundamental knowledge of risk reduction and risk management. They know methods of risk modelling and are able to apply them.

Examination: Active and regular attendance of lecture and practicals. Project work (graded).

Workload:

60 h: active attendance during lectures and exercises
90 h: review, preparation and weekly assignments
90 h: project work

Workload
The total workload for this module is approximately 270 hours.

Recommendations
The courses Remote Sensing Systems [20241/42] and Remote Sensing Methods [20265/66] may be chosen as a minimal combination for the exam. However, it is recommended to choose the comprehensive combination Remote Sensing [GEOD-BFB-1], which includes Remote Sensing Systems [20241/42], Remote Sensing Methods [20265/66] and the project Angewandte Fernerkundung [20267].

6.41 Module: Introduction to Operations Research [M-WIWI-101418]

Coordinators: Prof. Dr. Stefan Nickel
Prof. Dr. Steffen Rebennack
Prof. Dr. Oliver Stein

Organisation: KIT Department of Business and Economics

Part of: Operations Research (mandatory)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each summer term	2 terms	German	3	2

Mandatory			
T-WIWI-102758	Introduction to Operations Research I and II	9 CP	Nickel, Rebennack, Stein

Assessment
The assessment of the module is carried out by a written examination (120 minutes).
In each term (usually in March and August), one examination is held for both courses.

Prerequisites
None

Competence Goal
The student

- names and describes basic notions of the essential topics in Operations Research (Linear programming, graphs and networks, integer and combinatorial optimization, nonlinear programming, dynamic programming and stochastic models),
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve optimization problems independently,
- validates, illustrates and interprets the obtained solutions.

Content
This module treats the following topics: linear programming, network models, integer programming, nonlinear programming, dynamic programming, queuing theory, heuristic models.

This module forms the basis of a series of advanced lectures with a focus on both theoretical and practical aspects of Operations Research.

Module Grade Calculation
The overall grade of the module is the grade of the written examination.

Workload
The total workload for this module is approx. 270 hours (attendance time: 85 hours, other time for preparation and follow-up as well as exam preparation: 185 hours, 9 credit points).

The total workload of 9 credit points is divided into approx. 3.5 credit points in the first semester and 5.5 credit points in the second semester.

The total number of hours per course is calculated from the time required to attend lectures and tutorials, as well as the examination times and the time required to achieve the learning objectives of the module for an average student for an average performance.

6.42 Module: Introduction to Programming [M-WIWI-101581]

Coordinators: Prof. Dr.-Ing. Johann Marius Zöllner
Organisation: KIT Department of Business and Economics
Part of: Informatics (mandatory)

Credits	Grading	Recurrence	Duration	Language	Level	Version
5 CP	graded	Each winter term	1 term	German	3	1

Mandatory			
T-WIWI-102735	Introduction to Programming with Java	5 CP	Zöllner

Assessment
The assessment consists of a written resp. computer-based exam (60 min) according to Section 4 (2),1 of the examination regulation.
The successful completion of the compulsory tests in the computer lab is prerequisited for admission to the written resp. computer-based exam.
The examination takes place every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Competence Goal

- Knowledge of the fundamental principles, methods and systems of informatics.
- Students acquire the ability to independently solve algorithmic problems in the programming language Java, which is predominant in the field of business applications.
- This enables them to find strategic and creative answers in the search for solutions to precisely defined, concrete and abstract problems.

Content
With an introduction to systematic programming, the module provides essential practical foundations for all advanced computer science lectures. Based on considerations on the structured and systematic design of algorithms, the most important constructs of modern higher programming languages and programming methods are explained and illustrated using examples. One focus is on teaching the concepts of object-oriented programming. Java is used as the programming language. Knowledge of this language is assumed in the advanced computer science lectures.

Workload
Total workload for 5 credit points: approx. 150 hours

Attendance time: 45 hours

Preparation and follow-up of the course: 67.5 hours

Exam and exam preparation: 37.5 hours

6.43 Module: Introduction to Statistics [M-WIWI-101432]

Coordinators: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle

Organisation: KIT Department of Business and Economics

Part of: Statistics

Credits	Grading	Recurrence	Duration	Language	Level	Version
10 CP	graded	Each term	2 terms	German	3	2

Mandatory			
T-WIWI-102737	Statistics I	5 CP	Grothe, Schienle
T-WIWI-102738	Statistics II	5 CP	Grothe, Schienle

Assessment

The assessment of this module consists of two written examinations according to Section 4(2), 1 of the examination regulation (one for each of the courses Statistics I and II).

The overall grade of the module is the average of the grades of these two written examinations.

Prerequisites

Notice: The lecture *Statistics I* [25008/25009] is part of the preliminary examination concerning Section 8(1) of the examination regulation. This examination must be passed until the end of the examination period of the second semester. Any Re-examinations has to be passed until the end of the examination period of the third semester. Otherwise the examination claim will be lost.

Competence Goal

The student

- knows and understands the basic concepts of statistical data analysis and applies them independently to limited objects of investigation,
- knows and understands the basic definitions and statements of probability theory and applies them independently,
- transfers the theoretical foundations of statistical data analysis and probability theory to the issues of parametric estimation and test theory.

Content

The module contains the fundamental methods and scopes of Statistics.

A. Descriptive Statistics: univariate und bivariate analysis

B. Probability Theory: probability space, conditional and product probabilities, transformation of probabilities, parameters of location and dispersion, most importand discrete and continuous distributions, covariance and correlation, limit distributions

C. Theory of estimation and testing: suffiency of statistics, point estimation (optimality, ML-method), internal estimations, linear regression

Module Grade Calculation

The overall grade of the module is the average of the grades of these two written examinations.

Workload

The total workload for this module is approx. 300 hours (10 credits). The distribution is based on the credit points of the courses of the module.

The total number of hours per course is calculated from the time required to attend the lectures and exercises, the examination time and the time required for an average student to achieve the learning objectives of the module for an average performance.

Recommendations

It is strongly recommended to complete the course *Statistics I* [25008/25009] before the course *Statistics II* [25020/25021].

The lecture is accompanied by an exercise and a tutorial as well as a computer practical course, which are recommended.

M 6.44 Module: Leadership & Sustainable HR-Management [M-WIWI-106860]

Coordinators: Prof. Dr. Petra Nieken
Organisation: KIT Department of Business and Economics
Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	German	3	4

Mandatory			
T-WIWI-113745	HR-Management 1: HR Strategies in the Age of AI	4,5 CP	Nieken
Elective Offer (Election:)			
T-WIWI-114178	HR-Management 2: Organization, Fairness & Leadership	4,5 CP	Nieken
T-WIWI-111858	Topics in Human Resource Management	3 CP	Nieken

Assessment
The assessment is carried out as partial exams according to § 4 paragraph 2 Nr. 1 – Nr. 3 SPO of the examination regulation of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Competence Goal
The student

- understands and analyzes relevant processes, methods, and instruments in HR management and leadership, evaluating their usefulness,
- analyzes various processes and assesses their strengths and weaknesses, particularly regarding the use of AI in the workplace and sustainability aspects,
- understands the current challenges in HR management and leadership, considering their alignment with corporate strategy,
- evaluates the strengths and weaknesses of existing structures and regulations based on systematic criteria,
- possesses knowledge of the applicability and challenges of different scientific research methods.

Content
The module provides comprehensive knowledge in the areas of sustainable HR management, leadership, fair working conditions, and diversity and inclusion. Students engage deeply with the future of work. Topics range from classic HR themes such as recruiting and employee retention to AI in the workplace, fair working conditions, and sustainability.

Drawing on microeconomic and behavioral economic approaches, we analyze various processes and instruments, evaluating their alignment with corporate strategy. All courses within the module encourage active participation and empower students to learn cutting-edge concepts and methods, applying them to real-world challenges

Workload
Total workload for 9 credits: approx. 270 hours.

Recommendations
Completion of the core module "Management and Marketing" is recommended.
There is no fixed order for the courses of this module.

M 6.45 Module: Machine Learning and Data Science [M-WIWI-105482]

Coordinators: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Business and Economics
Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	English	3	1

Mandatory			
T-WIWI-111028	Introduction to Machine Learning	4,5 CP	Geyer-Schulz, Nazemi
T-WIWI-111029	Introduction to Neural Networks and Genetic Algorithms	4,5 CP	Geyer-Schulz

Assessment
The module examination is carried out in the form of partial examinations of the selected courses of the module, with which in total the minimum requirement of credit points is fulfilled. The kind of examination is described in detail for each course of this module.

Prerequisites
None

Competence Goal
The student

- knows the main families of machine learning methods, their basic principles, assumptions and restrictions.
- can use these methods to solve data analysis problems, to support decision making or for process automation in companies and use the solutions interpreted and evaluated accordingly.
- can compare and evaluate the performance of solutions.

Content
The module mainly focuses on methods from statistical learning (linear and logistic learning, regression, tree methods, SVMs, and shrinkage estimators) and from the field of neural and genetic procedures were presented. Furthermore, data transformations and -representations (e.g. dimension reduction, clustering, imputation in case of missing data) and visualization techniques and appropriate inference, diagnosis and validation techniques are presented.

Workload
Total effort for 9 credit points: approx. 270 hours. The allocation is based on the credit points of the courses of the module.

6.46 Module: Machine Tools and Industrial Handling [M-MACH-101286]

Coordinators: Prof. Dr.-Ing. Jürgen Fleischer
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each winter term	1 term	German	4	5

Mandatory			
T-MACH-110963	Machine Tools and High-Precision Manufacturing Systems	9 CP	Fleischer

Assessment
Oral exam (approx. 45 minutes)

Prerequisites
None

Competence Goal
The students

- are able to assess the use and application of machine tools and high-precision manufacturing systems and to differentiate between them in terms of their characteristics and design.
- can describe and discuss the essential elements of machine tools and high-precision manufacturing systems (frame, main spindle, feed axes, peripheral equipment, control unit).
- are able to select and dimension the essential components of machine tools and high-precision manufacturing systems.
- are capable of selecting and evaluating machine tools and high-precision manufacturing systems according to technical and economic criteria.

Content
The module gives an overview of the construction, use and application of machine tools and high-precision manufacturing systems. In the course of the module a well-founded and practice-oriented knowledge for the selection, design and evaluation of machine tools and high-precision manufacturing systems is conveyed. First, the main components of the systems are systematically explained and their design principles as well as the integral system design are discussed. Subsequently, the use and application of machine tools and high-precision manufacturing systems will be demonstrated using typical machine examples. Based on examples from current research and industrial applications, the latest developments are discussed, especially concerning the implementation of Industry 4.0 and artificial intelligence.
Guest lectures from industry round off the module with insights into practice.

The individual topics are:

- Structural components of dynamic manufacturing Systems
- Feed axes: High-precision positioning
- Spindles of cutting machine Tools
- Peripheral Equipment
- Machine control unit
- Metrological Evaluation
- Maintenance strategies and condition Monitoring
- Process Monitoring
- Development process for machine tools and high-precision manufacturing Systems
- Machine examples

Workload
regular attendance: 63 hours
self-study: 207 hours

Teaching and Learning Methods
Lecture, exercise, excursions

M 6.47 Module: Management Accounting [M-WIWI-101498]

Coordinators: Prof. Dr. Marcus Wouters
Organisation: KIT Department of Business and Economics
Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	see Annotations	2 terms	English	3	3

Mandatory			
T-WIWI-102800	Management Accounting 1	4,5 CP	Wouters
T-WIWI-102801	Management Accounting 2	4,5 CP	Wouters

Assessment
The course "Management Accounting 1" and the corresponding assessment for first-time examinees will be offered for the last time in the **summer semester 2026**.

The course "Management Accounting 2" and the corresponding assessment for first-time examinees will be offered for the last time in the **winter semester 2026/2027**.

The assessment is carried out as partial exams (according to Section 4 (2), 13 SPO) of the courses of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits
and truncated after the first decimal.

Competence Goal
Students

- are familiar with various management accounting methods,
- can apply these methods for cost estimation, profitability analysis, and product costing,
- are able to analyze short-term and long-decisions with these methods,
- have the capacity to devise instruments for organizational control.

Content
The module consists of two courses "Management Accounting 1" and "Management Accounting 2". The emphasis is on structured learning of management accounting techniques.

Additional Information
The course "Management Accounting 1" and the corresponding assessment for first-time examinees will be offered for the last time in the **summer semester 2026**.

The course "Management Accounting 2" and the corresponding assessment for first-time examinees will be offered for the last time in the **winter semester 2026/2027**.

Workload
Total workload for 9 credit points: approx. 270 hours

The exact distribution is based on the credit points of the courses in the module.

6.48 Module: Management and Marketing [M-WIWI-105768]

Coordinators: Prof. Dr. Martin Klarmann
Prof. Dr. Hagen Lindstädt
Prof. Dr. Petra Nieken
Prof. Dr. Orestis Terzidis

Organisation: KIT Department of Business and Economics

Part of: Business Administration (mandatory)

Credits	Grading	Recurrence	Duration	Language	Level	Version
5 CP	graded	Each winter term	1 term	German	3	2

Mandatory			
T-WIWI-111594	Management and Marketing	5 CP	Klarmann, Lindstädt, Nieken, Terzidis

Assessment
The module examination is in written form on the two courses "Managemet" and "Marketing". The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible at any regular examination date.

Competence Goal
The student

- has basic knowledge of central issues in business administration,
- has an understanding of problems, interrelationships and solutions in strategic management,
- is able to analyze and evaluate central areas of activity, functions and decisions in a company operating in a market economy,
- has an overview of important marketing-relevant questions and well-founded approaches to their solution.

With the knowledge acquired in the three basic business administration modules, the prerequisites are created in the area of business administration to expand this knowledge in the specialization program.

Content
An understanding of the basic functions of managing businesses is provided. In addition, the basics of marketing are taught.

Workload
Total workload required for 5 credit points: approx. 150 hours

M 6.49 Module: Manufacturing Technology [M-MACH-101276]

Coordinators: Prof. Dr.-Ing. Volker Schulze
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each winter term	1 term	German	3	7

Mandatory			
T-MACH-113570	Additive Manufacturing Processes	4 CP	Zanger
T-MACH-114058	Process Design for Machining of Metallic Components	4 CP	Schulze
T-MACH-114686	Overview of Manufacturing Technologies für Industrial Engineers	1 CP	Schulze

Assessment
Siehe einzelne Teilleistungen

Prerequisites
None

Competence Goal
The students

- can name different manufacturing processes, can describe their specific characteristics and are capable to depict the general function of manufacturing processes and are able to assign manufacturing processes to the specific main groups.
- are enabled to identify correlations between different processes and to select a process depending on possible applications.
- are capable to describe the theoretical basics for the manufacturing processes they got to know within the scope of the course and are able to compare the processes.
- are able to correlate based on their knowledge in materials science the processing parameters with the resulting material properties by taking into account the microstructural effects.
- are qualified to evaluate different processes on a material scientific basis.

Content
Within this engineering sciences-oriented module the students will get to learn principle aspects of manufacturing technology. Further information can be found at the description of the lectures.

Workload
regular attendance: 63 hours
self-study: 207 hours

M 6.50 Module: Materials Science [M-MACH-101260]

Coordinators: Dr.-Ing. Susanne Wagner
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (mandatory)

Credits	Grading	Recurrence	Duration	Level	Version
3 CP	graded	Each winter term	1 term	3	1

Mandatory			
T-MACH-102078	Materials Science I	3 CP	Wagner

Assessment
The assessment of the module is carried out by a written examination (150 min) about the lecture*Material ScienceI*[2125760] (according to Section 4(2), 1 of the examination regulation).

The examination is offered every semester. Re-examinations are offered at every ordinary examination date. The examination at the end of the summer term is carried out by a written or oral exam.

The grade of the module corresponds to the grade of this examination.

Prerequisites
None.

Competence Goal
Students are able to specify the basics of materials science and engineering and can apply it to simple problems in various technical areas.

As major part of the module, the students know the correlation between atomic structure and bonding of solids and the macroscopic properties such as mechanical behavior or electrical conductivity. They have basic knowledge with respect to materials characterization. The students are able to analyze phase diagrams with up to two components and can derive simple correlations among composition, processing, microstructure evolution and materials properties.

Content
After an introduction to the atomic structure and interatomic bonding, elementary concepts of crystallography are given. Different types of crystal structures are explained and various types of imperfections in solids. Then, the mechanical behaviour and the physical properties of various types of materials (metals, polymers, ceramics) are discussed. The thermodynamic principles of solidification and the basic types of phase diagrams are given to understand to iron-carbon phase diagram and the manifold microstructures of steel and cast iron.

Workload
The total workload for this module is approximately 90 hours.

M 6.51 Module: Mathematics 1 [M-MATH-105754]

Coordinators: Prof. Dr. Günter Last
Organisation: KIT Department of Mathematics
Part of: Mathematics

Credits	Grading	Recurrence	Duration	Language	Level	Version
10 CP	graded	Each winter term	1 term	German	3	1

Mandatory			
T-MATH-111492	Mathematics I - Midterm Exam	5 CP	Hug, Last, Nestmann, Winter
T-MATH-111493	Mathematics I - Final Exam	5 CP	Hug, Last, Nestmann, Winter

Assessment
The assessment consists of two written exams of 90 min each (in accordance with §4(2), 1 of the examination regulations). The first (midterm) exam takes place after half of the course, the second (final) exam takes place shortly after the end of the lectures. Auxiliary means such as literature or calculators are not allowed.

Resit exams for both exams are offered in the first weeks of the subsequent semester. Both resit exams will take place on the same day.

Candidates who have not passed the corresponding midterm or final exam, as well as those who have not yet taken a first attempt, will be eligible for the resit exams.

Oral re-examinations (in accordance with $9(1) of the examination regulations) for the midterm or final exam take place as individual examinations.

Both the midterm and final exams must be passed individually.

Prerequisites
none

Competence Goal
Students

- are confident with basic terms and definitions of mathematical language (propositions, sets, number systems, mappings, etc.),
- have a basic knowledge of differentiable calculus for functions of a single variable,
- know basic concepts of matrix theory,
- have a basic knowledge of integral calculus in a single variable.

Content
The course Mathematics 1 is the first part of the three semester basic training in higher mathematics. Topics are

- Propositional logic and basic set theory,
- Combinatorics and principles of counting,
- Number systems and basic arithmetics,
- Convergence of sequences and series,
- Continuous functions,
- Differentiable functions,
- Power series and special functions,
- Taylor's theorem,
- Riemann integral,
- n-dimensional vector spaces,
- Systems of linear equations,
- Scalar product, length and angle,
- Linear mappings and matrices,

Module Grade Calculation
The examination mark for Mathematics 1 is the average of the marks obtained in the midterm exam and final exam.

Workload
Work load: 300 hours (10 ETCS)

Classes: 150 hours

Preparation of courses and examinations: 150 hours

Recommendations
There are no prerequisites. It is strongly recommended to attend the three maths courses in the order Mathematics 1, Mathematics 2, Mathematics 3.

Literature
There are no Prerequisites. We strongly recommend to attend the three maths courses in the order Mathematics 1, Mathematics 2, Mathematics 3.

M 6.52 Module: Mathematics 2 [M-MATH-105756]

Coordinators: Prof. Dr. Günter Last
Organisation: KIT Department of Mathematics
Part of: Mathematics

Credits	Grading	Recurrence	Duration	Language	Level	Version
7 CP	graded	Each summer term	1 term	German	3	1

Mandatory			
T-MATH-111495	Mathematics II - Midterm Exam	3,5 CP	Hug, Last, Nestmann, Winter
T-MATH-111496	Mathematics II - Final Exam	3,5 CP	Hug, Last, Nestmann, Winter

Assessment
The assessment consists of two written exams of 75 min each (in accordance with §4(2), 1 of the examination regulations). The first exam (**midterm exam**) takes place after half of the course, the second exam (**final exam**) takes place shortly after the end of the lectures. Auxiliary means such as literature or calculators are not allowed.

Resit exams for both exams are offered in the first weeks of the subsequent semester. Both resit exams will take place on the same day.

Eligible for the resit exams are all candidates who either have not passed the corresponding midterm or final exam, or have not yet taken a first attempt.

Oral re-examinations (in accordance with $9(1) of the examination regulations) for the midterm or final exam take place as individual examinations.

Both the midterm and final exam must be passed individually.

Competence Goal
Students

- have a basic knowledge of determinants and eigenvalue theory,
- have a basic knowledge of multivariate differential calculus,
- have a basic knowledge of integrals of functions in several variables

Content
The course Mathematics 2 is the second part of the three semester basic training in higher mathematics. Topics are

- determinants,
- eigenvalue theory,
- multivariate calculus,
- multiple integrals,
- normed vector spaces and Banach's fixed point theorem.

Module Grade Calculation
The examination mark for Mathematics 2 is the average of the marks obtained in the midterm exam and final exam.

Workload
Work load: 210 hours (7 ETCS)

Classes: 120 hours

Preparation of courses and examinations: 90 hours

Recommendations
There are no prerequisites. It is strongly recommended to attend the three maths courses in the order Mathematics 1, Mathematics 2, Mathematics 3.

M 6.53 Module: Mathematics 3 [M-MATH-105757]

Coordinators: Prof. Dr. Günter Last
Organisation: KIT Department of Mathematics
Part of: Mathematics

Credits	Grading	Recurrence	Duration	Language	Level	Version
4 CP	graded	Each winter term	1 term	German	3	1

Mandatory			
T-MATH-111498	Mathematics III - Final Exam	4 CP	Hug, Last, Nestmann, Winter

Assessment
The assessment consists of a written exam of 75 min (in accordance with §4(2), 1 of the examination regulations). The exam takes place shortly after the end of the lectures. Auxiliary means such as literature or calculators are allowed.

A resit exam is offered in the first weeks of the subsequent semester.

Candidates who have not passed the exam, as well as those who have not yet taken a first attempt, will be eligible for the resit exam.

Oral re-examinations (in accordance with §8(2) of the examination regulations) for the written exam take place as individual examinations.

Competence Goal
Students

- are confident with important concepts in the theory of normed vector spaces,
- have some basic knowledge of ordinary differential equations,
- have some basic knowledge of Fourier analysis.

Content
The course Mathematics 3 is the third part of the three semester basic training in higher mathematics. Topics are

- normed spaces and Banach's fixed point theorem (if not treated in Mathematics 2),
- ordinary differential equations,
- linear differential equations,
- Fourier analysis,
- integral transformations.

Module Grade Calculation
The module grade is the grade of the written exam.

Workload
Work load: 120 hours (4 ETCS)

Classes: 60 hours

Preparation of courses and examinations: 60 hours

Recommendations
There are no prerequisites. It is strongly recommended to attend the three maths courses in the order Mathematics 1, Mathematics 2, Mathematics 3.

M 6.54 Module: Measurement, Control, and Manufacturing Measurement Technology [M-ETIT-106581]

Coordinators: Prof. Dr.-Ing. Michael Heizmann
Prof. Dr.-Ing. Sören Hohmann

Organisation: KIT Department of Electrical Engineering and Information Technology

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each summer term	1 term	German	3	1

Mandatory			
T-ETIT-112852	Measurement and Control Technology	6 CP	Heizmann, Hohmann
T-ETIT-106057	Manufacturing Measurement Technology	3 CP	Heizmann

Assessment

MRT:

The success control takes place in the form of a written examination of 120 minutes.

FMT:

The success control takes place in the form of a written examination of 90 minutes. If there are less than 20 examinees, an oral examination of approx. 20 minutes can be taken as an alternative. The module grade is the grade of the written or oral examination.

Prerequisites

none

Competence Goal

MRT:

- Students have a sound knowledge of the theoretical fundamentals of measurement technology, including scaling of measured quantities, the SI system of units, model building for measurement systems, description and treatment of systematic and stochastic measurement deviations, obtaining and linearizing measurement characteristics and propagation of measurement uncertainties.
- Students master the procedure for the basic design of measurement systems, taking into account the above knowledge.
- Students are able to analyze tasks in measurement technology, synthesize possible solutions for measurement systems and assess the properties of the solution obtained.
- The aim is to teach the basics of control engineering, therefore students are able to recognize and work on basic control engineering problems. They know the relevant technical terms.
- Students are able to formally describe real processes and to derive requirements for control structures in the time and image domain for fixed value and sequential control systems.
- Students are able to analyze the dynamics of systems using graphical and algebraic methods.
- Students will be able to name controller design methods for single-loop, single-variable systems. They will be able to design perfect closed-loop and open-loop control systems.
- They can perform design steps using the Nyquist criterion and the Wurzelortz curve.
- Students can name structures for disturbance compensation, of multi-loop control loops and two degrees of freedom structures and perform design steps for them.
- Students can digitize closed-loop and open-loop controls designed in the image domain using fast sampling design.
- Students are familiar with computer-aided design procedures and can carry out substeps in them.

FMT:

- Students have sound knowledge of fundamentals, methods and procedures for measuring and testing in industrial manufacturing.
- Students are able to evaluate different measuring principles, methods and devices with regard to their prerequisites, characteristics, areas of application and results.

Students are able to analyze production measurement tasks, derive the resulting requirements for a suitable metrological implementation, find suitable metrological implementations and point out the resulting properties of the measurement result....

Content
MRT:

- Description of measured quantities
    - Metric quantities and their properties
    - SI system of units
- Structure of measuring systems
- Measurement deviations
    - Systematic and stochastic deviations
- Curve fitting
    - Interpolation
    - Approximation
- Characteristic curves and their errors
    - Linearization of characteristic curves
    - Treatment of disturbance variables
- Uncertainty propagation
    - Error propagation
    - Guide to the Expression of Uncertainty in Measurement (GUM)
- Basic concepts of control engineering
    - Control loops
    - Control structures
    - Embedding in automation structures
- Description of systems in time and image domain
    - State space representation
    - Derivation of an I/O representation
    - Signal flow diagrams and control loop elements
    - Realization of controllers (analog and digital)
- Analysis of control loops in time and image domain
    - Stationary accuracy
    - Stability
    - Dynamics (bandwidth)
    - Robustness
- Design of single loop control loops
    - Perfect control
    - Design with the Nyquist criterion
    - Root locus curve
    - Heuristics
- Design of extended control loop structures
    - disturbance compensation
    - Meshing
    - Two degrees of freedom structure

FMT:

Manufacturing metrology plays an essential role in ensuring efficient industrial manufacturing. To a certain extent, it represents the sensory organs for quality assurance and automation technology and encompasses all activities associated with measurement and testing.

Based on the methodological fundamentals, which are the subject of the compulsory lecture "Measurement Technology", the lecture teaches procedures and implementations for measurement and testing in industrial practice. The focus is on geometric properties; most of the concepts presented can also be applied to other properties. Sensor systems for the measurement of geometric properties are presented and discussed with their characteristic properties.

The contents include in detail:

- Fundamentals of FMT
    - Basic terms, definitions
    - Dimensional standards
    - Measurement uncertainties
- Measurement technology in operation and in the measuring room
    - Coordinate metrology
    - Form and position metrology
    - Surface and contour metrology
    - Comparators
    - Micro and nano metrology
    - Measuring rooms
- Production-oriented metrology
    - Measuring equipment and gauges
    - Measuring devices
    - Measuring in the machine
    - Visual inspection

    - Statistical process control (SPC)
- Optical/non-contact measuring methods
    - Integratable optical sensors
    - Stand-alone optical measurement systems
    - Optical 2.5D coordinate measuring technology
    - Optical 3D coordinate metrology
    - Computed tomography
    - System integration and standardization
- Gauge management
    - Significance and correlations
    - Controlled inspection processes
- Inspection planning

Module Grade Calculation
The module grade is the average of both examination grades weighted by credit points.

Workload
MRT:

Total: approx. 180h, of which

1. Attendance time in lectures and exercises: 60h
2. Preparation and follow-up of the lectures and exercises: 60 hours
3. Exam preparation and presence in the same: 60h

FMT:

Total: approx. 90h, of which

1. attendance time in lectures: 23h
2. preparation of lectures: 23h
3. exam preparation and presence in the exam: 44h

Recommendations
MRT:

Knowledge of "Signale und Systeme" is helpful.

FMT:

Knowledge of stochastics and fundamentals of measurement techniques is helpful.

6.55 Module: Mechanical Design A [M-MACH-106527]

Coordinators: Prof. Dr.-Ing. Tobias Düser
Prof. Dr.-Ing. Sven Matthiesen

Organisation: KIT Department of Electrical Engineering and Information Technology
KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each winter term	1 term	German	3	3

Mandatory			
T-MACH-112984	Mechanical Design A	7 CP	Düser, Matthiesen
T-MACH-112981	Mechanical Design A, Workshop	2 CP	Düser, Matthiesen

Assessment
See individual courses

Prerequisites
None

Competence Goal
In mechanical design, students acquire skills in analysis and synthesis using examples. These include both individual machine elements such as bearings or springs and more complicated systems such as gears or couplings. After completing the machine design theory, the students are able to apply the contents learned to other technical systems - even those not known from the lecture - by transferring the principles of action and basic functions learned from examples to other contexts. This enables students to independently analyze unknown technical systems and synthesize suitable systems for given problems.

Content
MD A

- Springs
- Technical Systems
- Bearings
- Sealings
- Component Joints
- Gears

Module Grade Calculation
The module grade ist the grade of the written exam.

Additional Information
None

Workload
MKL A: Total workload: 270 h, thereof attendance 75 h, divided into lecture + exercise: 4 SWS -> 60 h as well as workshop: 1 SWS -> 15 h; self-study 195 h

Recommendations
None

Teaching and Learning Methods
Lectures, exercises and semester-long workshops as well as project work

Literature
Grundlagen der Berechnung und Gestaltung von Maschinenelementen; Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X oder Volltextzugriff über Uni-Katalog der Universitätsbibliothek

Grundlagen von Maschinenelementen für Antriebsaufgaben; Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8

Base For
None

6.56 Module: Mechatronic Product Design [M-MACH-106236]

Coordinators: Prof. Dr.-Ing. Sören Hohmann
Prof. Dr.-Ing. Sven Matthiesen

Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each winter term	1 term	German	3	1

Mandatory			
T-MACH-112647	Mechatronical Systems and Products	4 CP	Hohmann, Matthiesen
T-MACH-112648	Workshop Mechatronical Systems and Products	5 CP	Hohmann, Matthiesen

Assessment
Success is monitored within the framework of an written examination (60 minutes) and an alternative academic achievement

Prerequisites
None

Competence Goal
The students

- are able to describe the difficulties of interdisciplinary projects.
- are able to coordinate processes, structures, responsibilities and interfaces within a project
- know different solutions for mechanic/electric problems
- know the elements of the treated product development processes, are able to describe different views onto them and execute them
- know the model based systems engineering approaches
- know the basic principles of virtual design and are able to apply the methods of virtual system design
- are able to identify the differences between virtuality and reality
- are able to recognize the advantages of early validation
- Students are able to understand and apply model description with Bond graphs and generalized system elements
- Students are able to synthesize and analyze multi-domain models
- Students are able to apply parameter identification methods

Content
The lecture provides the theoretic basics, which will be applied and enhanced in development project during the semester. The project will take part in small groups, where the students have to organize and distribute the tasks on their own. In the project work - the workshop Mechatronic Systems and Products - they work on a development task in teams. This involves various development phases, from the development of technical solution concepts to the development and validation of virtual prototypes and physical functional prototypes.

Module Grade Calculation
The module grade is composed in equal parts of the grades of the module's sub-services.

Additional Information
All relevant content (scripts, exercise sheets, etc.) for the course can be obtained via the eLearning platform ILIAS. To participate in the course, please complete the survey " Anmeldung und Gruppeneinteilung " in ILIAS before the start of the semester.

Workload
1. Time of presence lecture: 17 * 1.5 h= 25,5 h

2. Prepare/follow-up lecture: 17 * 1.5 h= 25,5 h

3. Time of presence exercise + workshop: 4 * 1,5h + 12 * 7h = 90 h

4. Prepare/follow-up exercise: 4 * 1.5h = 6 h

5. Exam preparation and time of presence: 33 h
Total: 180 h = 6 LP

Recommendations
It is recommended not to take this module with other time-consuming workshops, such as MD, at the same time.

Teaching and Learning Methods
Lecture, exercise and project work

Literature
Janschek, Klaus (2010): Systementwurf mechatronischer Systeme. Methoden - Modelle - Konzepte. Berlin, Heidelberg: Springer.

Weilkiens, Tim (2008): Systems engineering mit SysML/UML. Modellierung, Analyse, Design. 2., aktualisierte u. erw. Aufl. Heidelberg: Dpunkt-Verl.

M 6.57 Module: Methodical Foundations of OR [M-WIWI-101414]

Coordinators: Prof. Dr. Oliver Stein
Organisation: KIT Department of Business and Economics
Part of: Operations Research (Specialisation Program Operations Research)
Compulsory Elective Modules (Operations Research)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German	3	10

Compulsory Elective Courses (Election: at least 1 item as well as between 4,5 and 9 credits)			
T-WIWI-102726	Global Optimization I	4,5 CP	Stein
T-WIWI-103638	Global Optimization I and II	9 CP	Stein
T-WIWI-102724	Nonlinear Optimization I	4,5 CP	Stein
T-WIWI-103637	Nonlinear Optimization I and II	9 CP	Stein
Supplementary Courses (Election:)			
T-WIWI-106546	Introduction to Stochastic Optimization	4,5 CP	Rebennack
T-WIWI-102727	Global Optimization II	4,5 CP	Stein
T-WIWI-102725	Nonlinear Optimization II	4,5 CP	Stein
T-WIWI-102704	Facility Location and Strategic Supply Chain Management	4,5 CP	Nickel

Assessment
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
At least one of the courses *Nonlinear Optimization I* [2550111] and *Global Optimization I* [2550134] has to be examined.

Competence Goal
The student

- names and describes basic notions for optimization methods, in particular from nonlinear and from global optimization,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve also challenging optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions.

Content
The modul focuses on theoretical foundations as well as solution algorithms for optimization problems with continuous decision variables. The lectures on nonlinear programming deal with local solution concepts, whereas the lectures on global optimization treat approaches for global solutions.

Additional Information
The planned lectures and courses for the next three years are announced online (http://www.ior.kit.edu).

Workload
The total workload for this module is approx. 270 hours (9 credits). The allocation is based on the credit points of the courses in the module.

The total number of hours per course results from the time required to attend the lectures and exercises, as well as the examination times and the time required to achieve the learning objectives of the module for an average student for an average performance.

Recommendations
The courses Introduction to Operations Research I and II are helpful.

M 6.58 Module: Microsystem Technology [M-MACH-101287]

Coordinators: Prof. Dr. Jan Gerrit Korvink
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German	4	7

Mikrosystemtechnik (Election: at least 9 credits)			
T-MACH-100967	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II	3 CP	Guber
T-MACH-100968	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III	3 CP	Guber
T-MACH-111807	Introduction to Bionics	3 CP	Hölscher
T-MACH-114100	Introduction to Microsystem Technology I	3 CP	Badilita, Korvink
T-MACH-114101	Introduction to Microsystem Technology II	3 CP	Badilita, Korvink
T-MACH-108312	Introduction to Microsystem Technology - Practical Course	3 CP	Last
T-MACH-101910	Microactuators	3 CP	Kohl
T-MACH-102152	Novel Actuators and Sensors	4 CP	Kohl, Sommer
T-ETIT-101907	Optoelectronic Components	4 CP	Huber-Loyola
T-MACH-100530	Physics for Engineers	6 CP	Nesterov-Müller

Assessment
The assessment is carried out as partial exams

(according to Section 4 (2), 1-3 SPO) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
none

Competence Goal
construction and production of e. g. mechanical, optical, fluidic and sensory microsystems.

Content
The module offers courses in microsystem technology. Knowledge is imparted in various fields like basics in construction and production of e. g. mechanical, optical, fluidic and sensory microsystems.

Workload
270 hours

6.59 Module: Mobile Machines [M-MACH-101267]

Coordinators: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Level	Version
9 CP	graded	Each winter term	2 terms	4	6

Mandatory			
T-MACH-105168	Mobile Machines	8 CP	Geimer
Mobile Machines (Election: at least 1 credit)			
T-MACH-105311	Design and Development of Mobile Machines	4 CP	Geimer
T-MACH-108887	Design and Development of Mobile Machines - Advance	0 CP	Geimer, Siebert
T-MACH-111389	Fundamentals in the Development of Commercial Vehicles	3 CP	Weber
T-MACH-111821	Control of Mobile Machines	4 CP	Becker, Geimer
T-MACH-111820	Control of Mobile Machines – Prerequisites	0 CP	Becker, Geimer
T-MACH-113997	Vehicle Drive Technology	4 CP	Geimer
T-MACH-113862	Simulation with Lumped Parameters	3 CP	Geimer
T-MACH-113863	Tutorial Simulation with Lumped Parameters	1 CP	Geimer
T-MACH-113912	Mathematical Methods in Hydraulics	4 CP	Geimer
T-MACH-113913	Tutorial Mathematical Methods in Hydraulics	2 CP	Geimer

Assessment
The assessment is carried out as a general oral exam (duration approx. 60 mins) (according to Section 4(2), 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The examination is offered every semester. Re-examinations are offered at every ordinary examination date.

The overall grade of the module is the grade of the oral examination.

The assessment may be carried out as partial oral exams (according to Section 4(2), 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.In this case the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

The assessment procedures are described for each course of the module seperately.

Prerequisites
Successful passing of the corresponding modules of the basic program.

Competence Goal
The student

- knows and understands the basic structure of the machines
- masters the basic skills to develop the selected machines

Content
In the module of *Mobile Machines* [WI4INGMB15] the students will learn the structure of the machines and deepen the knowledge of the subject for developing the machines. After conclusion the module the student will know the latest developments in mobile machines and is able to evaluate the concepts and the trends of developments. The module is practically orientated and supported by industry partners.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.

Recommendations
Knowledge of Fluid Power Systems are helpful, otherwise it is recommended to take the course *Fluid Power Systems* [2114093].

6.60 Module: Mobility and Infrastructure [M-BGU-101067]

Coordinators: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each summer term	1 term	German	3	2

Mandatory			
T-BGU-101791	Mobility and Infrastructure	9 CP	Vortisch

Assessment
- module component T-BGU-101791 with written examination according to § 4 Par. 2 No. 1

details about the learning control, see module component

Prerequisites
none

Competence Goal
Students will be able to name and explain the basic methods and procedures for dealing with general issues in spatial planning, transport studies and highway engineering. They will be able to carry out basic calculations in relation to the specialist areas mentioned and use the necessary tools methodically and appropriately. Furthermore, they can argue, find, develop and evaluate solutions.

Content
The module is divided into 3 parts:

The spatial planning and planning law part of the module covers fundamental tasks and issues at different planning levels such as land use and land use conflicts, development and infrastructure including their costs, urban land use planning, regional and state planning and planning at European level.

The basics of transport planning (analysis conventions, surveys, algorithms) as well as the basics of traffic engineering are covered in the transport studies part of the module.

The module part Design principles in road engineering covers road network design, road routing including the basics of driving dynamics, earthworks as well as roadway constructions and their design.

Module Grade Calculation
grade of the module is grade of the exam

Additional Information
none

Workload
contact hours (1 HpW = 1 h x 15 weeks):

- Spatial Planning and Planning Law lecture, exercise: 45 h
- Transportation lecture, exercise: 45 h
- Design Basics in Highway Engineering lecture, exercise:45 h

independent study:

- preparation and follow-up lectures, exercises Spatial Planning and Planning Law: 30 h
- preparation and follow-up lectures, exercises Transportation: 30 h
- preparation and follow-up lectures, exercises Design Basics in Highway Engineering: 30 h
- examination preparation: 90 h

total: 355 h

Recommendations
For students from the KIT-Department of Economics and Management it is recommended to take part in the excercises.

M 6.61 Module: Optimization under Uncertainty [M-WIWI-103278]

Coordinators: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Business and Economics
Part of: Operations Research (Specialisation Program Operations Research)
Compulsory Elective Modules (Operations Research)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German	3	5

Compulsory Elective Courses (Election: between 1 and 2 items)			
T-WIWI-106546	Introduction to Stochastic Optimization	4,5 CP	Rebennack
T-WIWI-106545	Optimization under Uncertainty	4,5 CP	Rebennack
Supplementary Courses (Election: at most 1 item)			
T-WIWI-102724	Nonlinear Optimization I	4,5 CP	Stein
T-WIWI-102714	Tactical and Operational Supply Chain Management	4,5 CP	Nickel

Assessment
The assessment is carried out as partial exams (according to § 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
At least one of the courses *Introduction to Stochastic Optimization*and *Optimization approaches under uncertainty*has to be taken.

Competence Goal
The student

- denominates and describes basic notions for optimization methods under uncertainty, in particular from stochastic optimization,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems under uncertainty and chooses the appropriate solution methods to solve also challenging optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions, in particular of
- stochastic optimization problems.

Content
The module focuses on modeling and analyzing mathematical optimization problems where certain data is not fully present at the time of decision-making. The lectures on the introduction to stochastic optimization deal with methods to integrate distribution information into the mathematical model. The lectures on the optimization approaches under uncertainty offer alternative approaches such as robust optimization.

Additional Information
The curriculum, planned for three years in advance, can be found on the Internet at http://sop.ior.kit.edu/28.php.

Workload
The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

Recommendations
Knowledge from the lectures "Introduction to Operations Research I" and "Introduction to Operations Research II" are helpful.

M 6.62 Module: Preliminary Exam [M-WIWI-100950]

Organisation: University
Part of: Preliminary Exam

Credits	Grading	Recurrence	Duration	Language	Level	Version
0 CP	pass/fail	Each term	2 terms	German	3	1

Mandatory			
T-WIWI-102708	Economics I: Microeconomics	5 CP	Puppe, Reiß
T-WIWI-102737	Statistics I	5 CP	Grothe, Schienle

Modeled Deadline
This module must be passed until the end of the **3. semester**.

Prerequisites
none

6.63 Module: Production Engineering [M-MACH-106590]

Coordinators: Prof. Dr.-Ing. Volker Schulze
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	German	3	5

Production Engineering (Election: at least 9 credits)			
T-MACH-113985	Additive Manufacturing of Metallic Components	4 CP	Zanger
T-MACH-113647	Digitalization from Product Concept to Production	4 CP	Wawerla
T-MACH-114800	Global Production	5 CP	Lanza
T-MACH-105188	Integrative Strategies in Production and Development of High Performance Cars	4 CP	Schlichtenmayer
T-MACH-112115	Artificial Intelligence in Production	5 CP	Fleischer
T-MACH-105783	Learning Factory "Global Production"	6 CP	Lanza
T-MACH-108878	Laboratory Production Metrology	5 CP	Benfer, Lanza
T-MACH-110318	Product- and Production-Concepts for Modern Automobiles	4 CP	Kienzle, Steegmüller
T-MACH-110984	Production Technology for E-Mobility	4 CP	Fleischer
T-MACH-113575	Project Course Additive Manufacturing: Design Optimization and Production of Metallic Components	4 CP	Zanger
T-MACH-102107	Quality Management	4 CP	Lanza
T-MACH-113031	Rapid Industrialization of Immature Products using the Example of Electric Mobility	4 CP	Bauer
T-MACH-112121	Seminar Application of Artificial Intelligence in Production	4 CP	Fleischer
T-MACH-105185	Control Technology	4 CP	Gönnheimer
T-MACH-114969	Strategic Decision-Making in Global Production Networks through Optimization and Simulation	4 CP	Lanza, Martin
T-MACH-105177	Metal Forming	4 CP	Herlan
T-MACH-102148	Gear Cutting Technology	4 CP	Klaiber

Assessment
Oral exams: duration approx. 5 min per credit point

Written exams: duration approx. 20 - 25 min per credit point

Amount, type and scope of the success control can vary according to the individually choice.

Prerequisites
The module M-MACH-101284 -Production Technology must not have been started.

Competence Goal
The students

- are able to apply the methods of production science to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques for a specific problem.
- are able to use their knowledge target-oriented to achieve an efficient production technology.
- are able to analyze new situations and choose methods of production science target-oriented based on the analyses, as well as justifying their selection.
- are able to describe and compare complex production processes exemplarily.

Content
Within this module the students will get to know and learn about production science. Manifold lectures and excursions as part of several lectures provide specific insights into the field of production science.

Workload
The work load is about 270 hours, corresponding to 9 credit points.

Teaching and Learning Methods
Lectures, seminars, workshops, excursions

M 6.64 Module: Production, Logistics and Information Systems [M-WIWI-105770]

Coordinators: Dr.-Ing. Hannah Bakker
Prof. Dr. Wolf Fichtner
Prof. Dr. Andreas Geyer-Schulz
Prof. Dr. Alexander Mädche
Prof. Dr. Frank Schultmann
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Business and Economics

Part of: Business Administration (mandatory)

Credits	Grading	Recurrence	Duration	Language	Level	Version
5 CP	graded	Each winter term	1 term	German	3	2

Mandatory			
T-WIWI-111602	Production, Logistics and Information Systems	5 CP	Fichtner, Geyer-Schulz, Mädche, Nickel, Schultmann, Weinhardt

Assessment
The module examination (90 min) is in written form. The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible at any regular examination date.

Competence Goal
The student

- has basic knowledge of the interaction of information technologies, people and organizational structures,
- is familiar with the structures of information systems,
- masters the essential concepts, theories and methods of production management,
- has an understanding of problems, interrelationships and solutions of logistics processes of enterprises.

With the knowledge acquired in the three basic modules BWL, the prerequisites are created in the area of BWL to expand this knowledge in the specialization program.

Content
The basics of business informatics are taught. In addition, the area of production management and logistics is introduced.

Workload
Total workload required for 5 credit points: approx. 150 hours

M 6.65 Module: Public and Civil Law [M-INFO-105084]

Coordinators: N.N.
Organisation: KIT Department of Informatics
Part of: Compulsory Elective Modules (Law or Sociology)

Credits	Grading	Recurrence	Duration	Level	Version
9 CP	graded	Each term	2 terms	3	2

Mandatory			
T-INFO-103339	Civil Law for Beginners	5 CP	Matz
T-INFO-110300	Public Law I & II	6 CP	Zufall

Assessment
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations take place in every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
None

Workload
See German version.

6.66 Module: Public Finance [M-WIWI-101403]

Coordinators: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Business and Economics
Part of: Economics (Specialisation Program Economics)
Compulsory Elective Modules (Economics)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German	3	7

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-102877	Introduction to Public Finance	4,5 CP	Wigger
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CP	Gutekunst, Wigger
T-WIWI-102739	Public Revenues	4,5 CP	Wigger

Assessment
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offerd at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Competence Goal
The student

- has advanced knowledge of the theory and policy of taxation and public debt.
- understand the scope, structure and forms of government borrowing.
- is familiar with the structure of German and international tax law
- is able to interpret and motivate fiscal policy issues.

Content
As a branch of Economics, Public Finance is concerned with the theory and policy of the public sector and its interrelations with the private sector. It analyzes the economic role of the state from a normative as well as from a positive point of view. The normative view examines efficiency- and equity-oriented motives for government intervention and develops fiscal policy guidelines. The positive view explains the actual behavior of economic agents in public sector affairs. Special fields of Public Finance are public revenues, i.e. taxes and public debt, public expenditures for publicly provided goods, and welfare programs.

Additional Information
The course T-WIWI-102790 "Specific Aspects in Taxation" will no longer be offered in the module as of winter semester 2018/2019.

Workload
Total workload for 9 credit points: approx. 270 hours

The exact distribution is based on the credit points of the courses in the module.

Recommendations
It is recommended to attend the course 2560129 after having completed the course 2560120.

M 6.67 Module: Rail System Technology and Rail Vehicle Technology [M-MACH-107717]

Coordinators: Prof. Dr.-Ing. Martin Cichon
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German	4	1

Mandatory			
T-MACH-106424	Rail System Technology	4,5 CP	Cichon
T-MACH-105353	Rail Vehicle Technology	4,5 CP	Cichon

Assessment
Two separate written examinations
Duration: 60 minutes Rail System Technology and 60 minutes Rail Vehicle Technology
Aids: none except calculator and dictionary

Competence Goal

- The students understand relations and interdependencies between rail vehicles, infrastructure and operation in a rail system.
- Based on operating requirements and legal framework they derive the requirements concerning a capable infrastructure and suitable concepts of rail vehicles.
- They recognize the impact of alignment, understand the important function of the wheel-rail-contact and estimate the impact of driving dynamics on the operating program.
- They evaluate the impact of operating concepts on safety and capacity of a rail system.
- They know the infrastructure to provide power supply to rail vehicles with different drive systems.
- The students learn the role of rail vehicles and understand their classification. They understand the basic structure und know the functions of the main systems. They understand the overall tasks of vehicle system technology.
- They learn functions and requirements of car bodies and jugde advantages and disadvantages of design principles. They know the functions of the car body’s interfaces.
- They know about the basics of running dynamics and bogies.
- The students learn about advantages and disadvantages of different types of traction drives and judge, which one fits best for each application.
- They understand brakes from a vehicular and an operational point of view. They assess the fitness of different brake systems.
- They know the basic setup of train control management system and understand the most important functions.
- They specify and define suitable vehicle concepts based on requirements for modern rail vehicles.

Content

1. Railway System: railway as system, subsystems and interdependencies, definitions, laws, rules, railway and environment, economic impact
2. Operation: Transportation, public transport, regional transport, long-distance transport, freight service, scheduling
3. Infrastructure: rail facilities, track alignment, railway stations, clearance diagram
4. Wheel-rail-contact: carrying of vehicle mass, adhesion, wheel guidance, current return
5. Vehicle dynamics: tractive and brake effort, driving resistance, inertial force, load cycles
6. Signaling and Control: operating procedure, succession of trains, European Train Control System, blocking period, automatic train control
7. Traction power supply: power supply of rail vehicles, comparison electric traction and diesel traction, dc and ac networks, system pantograph and contact wire, filling stations
8. Vehicle system technology: structure and main systems of rail vehicles
9. Car body: functions, requirements, design principles, crash elements, coupling, doors and windows
10. Bogies: forces, running gears, bogies, Jakobs-bogies, active components, connection to car body, wheel arrangement
11. Drives: priciples, electric drives (main components, asynchronous traction motor, inverter, with DC supply, with AC supply, without line supply, multisystem vehicles, dual mode vehicles, hybrid vehicles), non-electric drives
12. Brakes: basics, principles (wheel brakes, rail brakes, blending), brake control (requirements and operation modes, pneumatic brake, electropneumatic brake, emergency brake, parking brake)
13. Train control management system: definition of TCMS, bus systems, components, network architectures, examples, future trends
14. Vehicle concepts: trams, metros, regional trains, intercity trains, high speed trains, double deck vehicles, locomotives, freight wagons

Additional Information
A bibliography is available for download (Ilias-platform).

The lectures can be attended in the same term.

Workload

1. Regular attendance: 42 hours
2. Self-study: 42 hours
3. Exam and preparation: 186 hours

Teaching and Learning Methods
Lectures

6.68 Module: Seminar Module [M-WIWI-101816]

Coordinators: Studiendekan des KIT-Studienganges
Organisation: KIT Department of Business and Economics
Part of: Compulsory Elective Modules (mandatory)

Credits	Grading	Recurrence	Duration	Language	Level	Version
3 CP	graded	Each term	1 term	German/English	3	7

Compulsory Elective Courses (Election: 3 credits)			
T-WIWI-103486	Seminar in Business Administration (Bachelor)	3 CP	Professorenschaft des Fachbereichs Betriebswirtschaftslehre
T-WIWI-103485	Seminar in Informatics (Bachelor)	3 CP	Professorenschaft des Instituts AIFB
T-MATH-102265	Seminar in Mathematics (Bachelor)	3 CP	Last, Nestmann, Winter
T-WIWI-103488	Seminar in Operations Research (Bachelor)	3 CP	Nickel, Rebennack, Stein
T-INFO-115024	Seminar: Legal Studies Bachelor	3 CP	Professorenschaft des Fachbereichs Recht
T-WIWI-103489	Seminar in Statistics (Bachelor)	3 CP	Grothe, Schienle
T-WIWI-108763	Seminar in Engineering Science Master (approval)	3 CP	Fachvertreter ingenieurwissenschaftlicher Fakultäten
T-WIWI-103487	Seminar in Economics (Bachelor)	3 CP	Professorenschaft des Fachbereichs Volkswirtschaftslehre
T-MACH-102135	Conveying Technology and Logistics	3 CP	Furmans
T-MACH-109062	Seminar Production Technology	3 CP	Fleischer, Lanza, Schulze
T-MACH-108737	Seminar Data-Mining in Production	3 CP	Lanza

Assessment

SPO 2015: The modul examination consists of **one** seminar (according to §4 (3), 3 of the examintaion regulation). A detailed description of the assessment is given in the specific course characerization.

SPO 2007: The modul examination consists of **two** seminars and of at least one **key qualification** (KQ) course (according to §4 (3), 3 of the examintaion regulation). As key qualification one of the following courses must be chosen: Academic Learning HoC (2-3 credits), Key Qualifikations ZAK (1-3 credits), Elective „Educational development for student teachers“ (2-3 credits) or language courses SpZ. A detailed description of every singled assessment is given in the specific course characerization.

Prerequisites

All modules of the core or foundation program should be successfully completed. The following can be taken:

- Business administration, economics, INFO, OR and statistics seminars.
- Seminars offered for WiWi degree programs at the KIT Department of Mathematics.
- Law and sociology seminars, provided that a law or sociology module is taken as an elective module (subject to approval).
- Engineering science seminars that match an ING module taken in the compulsory ING specialization (exception: module "Specialization in engineering fundamentals") or the compulsory elective area. Coherence of content is deemed to be given if the seminar and module are taken at the same ING institute. If this is not the case, it is necessary for the ING module coordinator of an engineering module taken to certify that the planned ING seminar matches the content of his/her module. Engineering seminars of the WBK (Production Engineering) and IFL (Logistics) do not have to fulfill this requirement. The seminar must meet the performance standards of the KIT Department of Economics and Management (seminar course of 2 SWS, regular and active participation, seminar paper on one aspect of the seminar topic, presentation, total workload approx. 90 hours). Engineering seminars for the seminar module are generally **subject to approval** and must be applied for at the Examination Office. The application for admission is made via the corresponding engineering seminar form on the department's download page. (Seminars of the wbk and the IFL are exempt from this approval requirement).

Competence Goal

- Students are able to independently deal with a defined problem in a specialized field based on scientific criteria.
- They are able to research, analyze the information, abstract and derive basic principles and regularities from unstructured information.
- They can solve the problems in a structured manner using their interdisciplinary know-how.
- They know how to validate the obtained results.
- Finally, they are able to logically and systematically present the results both orally and in written form in accordance with scientific guidelines (structuring, technical terminology, referencing). They can argue and defend the results professionally in the discussion.
- Students are familiar with the DFG´s Code of Conduct "Guidelines for Safeguarding Good Research Practice" and base their scientific work on it.

Content

Competences which are gained in the seminar module especially prepare the student for composing the final thesis. Within the term paper and the presentation the student exercises himself in scientific working techniques supported by the supervisor.

Beside advancing skills in techniques of scientific working there are gained integrative key qualifications as well. A detailled description o these qualifications is given in the section “Key Qualifications” of the module handbook.

Furthermore, the module also includes additional key qualifications provided by the KQ-courses.

Additional Information

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: https://portal.wiwi.kit.edu.

Workload

The total workload for this module is approx. 90 hours (3 CP) (SPO 2015) or 270 hours (9 CP) (SPO 2007).

M 6.69 Module: Signals and Systems [M-ETIT-106372]

Coordinators: Dr.-Ing. Mathias Kluwe
Prof. Dr.-Ing. Sander Wahls

Organisation: KIT Department of Electrical Engineering and Information Technology

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each winter term	2 terms	German	3	2

Mandatory			
T-ETIT-112860	Signals and Systems	7 CP	Kluwe, Wahls
T-ETIT-112861	Signals and Systems - Workshop	2 CP	Wahls

Assessment
The assessment of success takes place in the form of a written examination lasting 180 minutes. In addition, the completion of the written work in the workshop is a prerequisite for passing the module.

Prerequisites
none

Competence Goal

- Students are familiar with the elementary properties of signals and systems in the time domain and can analyze existing signals and systems with regard to these properties.
- They are familiar with the Fourier, Laplace and Z transforms with their definitions and calculation rules and can apply these to given signals and systems.
- Students are able to describe given signals and systems using the resulting transforms and analyze their respective properties in the frequency domain.
- They determine e.g. continuous-time low-pass filters that fulfill given specifications.
- They are able to design anti-aliasing and interpolation filters for A/D and D/A conversion.
- Students are able to realize given continuous-time systems digitally.

Content

- Introduction, complex numbers, continuous-time signals, signal space L∞
- Signal spaces L1 and L2 (Lebesgue integral, Hilbert space)
- Continuous-time systems in the time domain (linearity, time invariance, stability, convolution representation)
- Fourier series
- Fourier transform I (derivation & existence, pairs)
- Fourier transform II (properties, description of time-continuous systems)
- Meaning of phase (group delay, all-pass, minimum phase)
- Low-pass filter (Butterworth, Chebyshev)
- Uncertainty principle (mean time/frequency/duration/bandwidth)
- Complex analysis I (basics of complex functions, differentiation, holomorphic functions, Cauchy Riemann differential equations, curve integrals)
- Complex Analysis II (Cauchy integral theorem, Laurent expansions, isolated singularities, meromorphic functions, residue theorem)
- Hilbert transform (Bedrosian/envelope, Kramers-Kronig, phase gain)
- Two-sided Laplace transform and systems with rational transfer function
- Bode plots
- Discrete-time signals and spaces, sampling theorem, interpolation filters, aliasing
- Discrete Fourier series and transformation
- Z-transform and discrete-time systems
- Discrete-time processing of continuous-time signals (anti-aliasing filters with oversampling and undersampling)
- One-sided Laplace transform (def. incl. some properties and calculation rules) c
- Solution of ordinary differential equations, back transformation via partial fraction decomposition
- Alternatives of the Laplace inverse transform (convolution, complex inverse formula)
- One-sided z-transformation
- Solving difference equations with the z-transform

Module Grade Calculation
The module grade is the grade of the written exam.

Workload
Total approx. 240h, of which

Attendance time in lectures and exercises: 75h

Preparation/follow-up of the lectures and exercises: 130h

3. Exam preparation and presence in the same: 40h

Preparation time for the workshop: 5h

Presence time in the workshop: 15h

Preparation of the protocol for the workshop: 5h

Total: 270 LP = 9 LP

Recommendations
Knowledge of higher mathematics (e.g. M-MATH-101731, M-MATH-101732 and M-MATH-101738) is required. Fundamentals of electrical circuits and networks (e.g. M-ETIT-106417 - Lineare Elektrische Netze) are helpful.

M 6.70 Module: Sociology/Empirical Social Research [M-GEISTSOZ-101167]

Coordinators: Prof. Dr. Gerd Nollmann
Organisation: KIT Department of Humanities and Social Sciences
Part of: Compulsory Elective Modules (Law or Sociology)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each winter term	2 terms	German	3	2

Mandatory			
T-GEISTSOZ-109047	Analalysis of Social Structurs (WiWi)	3 CP	Nollmann
T-GEISTSOZ-109048	Social Science A (WiWi)	3 CP	Nollmann
T-GEISTSOZ-109049	Social Science B (WiWi)	3 CP	Nollmann

Competence Goal
The student

- Gains theoretical and methodical knowledge of social processes and structures
- Is able to apply acquired knowledge practically
- Is able to present work results in a precise and clear way

Content
This module offers students the possibility to get to know research problems and to answer these theoretically as well as empirically. For example: Who does earn how much in his job and why? How do subcultures emerge? Why are boys' grades in school always worse than those of girls? Do divorces have negative influences on the development of children? How does mass consumption influence the individual? Is there a world society emerging? In addition, this module contains courses on sociological methods that are essential to answer such questions scientifically.

The lecture on social structure analysis gives an overview of large social structures such as the education system, labour market, institutions, demography, etc. for Germany and in international comparison. The content of the social research seminars is determined individually by the lecturers. Students are free to choose one seminar each for Social Research A/B.

M 6.71 Module: Statistics and Econometrics [M-WIWI-101599]

Coordinators: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle

Organisation: KIT Department of Business and Economics

Part of: Economics (Specialisation Program Economics)
Compulsory Elective Modules (Economics)
Compulsory Elective Modules (Statistics)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	3	7

Mandatory			
T-WIWI-114622	Introduction to Econometrics	5 CP	Schienle
Supplementary Courses (Election: between 1 and 2 items)			
T-WIWI-103063	Analysis of Multivariate Data	4,5 CP	Grothe
T-WIWI-103064	Financial Econometrics	4,5 CP	Schienle
T-WIWI-110939	Financial Econometrics II	4,5 CP	Schienle
T-WIWI-112153	Microeconometrics	4,5 CP	Krüger
T-WIWI-103065	Statistical Modeling of Generalized Regression Models	4,5 CP	Heller

Assessment
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
The course "Introduction in Econometrics“ is compulsory and must be examined. In case the course „Economics III: Introduction in Econometrics“ has already been examined within the module „Applied Microeconomics“, the course „Economics III: Introduction in Econometrics“ is not compulsory.

Competence Goal
The student

- shows an advanced understanding of Econometric techniques and statistical model building.
- is able to develop Econometric models for applied problems based on available data
- is able to apply techniques and models with statistical software, to interpret results and to judge on different approaches with appropriate statistical criteria.

Content
The courses provide a solid Econometric and statistical foundation of techiques necessary to conduct valid regression, time series and multivariate analysis.

Workload
The total workload for this module is approximately 270 hours.

M 6.72 Module: Statistics and Econometrics II [M-WIWI-105414]

Coordinators: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Business and Economics
Part of: Economics (Specialisation Program Economics)
Compulsory Elective Modules (Economics)
Compulsory Elective Modules (Statistics)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	3	5

Compulsory Elective Courses (Election:)			
T-WIWI-103063	Analysis of Multivariate Data	4,5 CP	Grothe
T-WIWI-114622	Introduction to Econometrics	5 CP	Schienle
T-WIWI-103064	Financial Econometrics	4,5 CP	Schienle
T-WIWI-110939	Financial Econometrics II	4,5 CP	Schienle
T-WIWI-112153	Microeconometrics	4,5 CP	Krüger
T-WIWI-103065	Statistical Modeling of Generalized Regression Models	4,5 CP	Heller

Assessment
The assessment is carried out as partial exams of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
The following module must have been started: Statistics and Econometrics [M-WIWI-101599].

Competence Goal
The student

- shows an advanced understanding of Econometric techniques and statistical model building.
- is able to develop advanced Econometric models for applied problems based on available data
- is able to apply techniques and models efficiently with statistical software, to interpret results and to judge on different approaches with appropriate statistical criteria.

Content
The courses provide foundations of advanced Econometric and statistical techiques for regression, time series and multivariate analysis.

Workload
The total workload for this module is approximately 270 hours.

M 6.73 Module: Strategy and Organization [M-WIWI-101425]

Coordinators: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Business and Economics
Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	2 terms	German	3	7

Strategy and Organization (Election: at least 9 credits)			
T-WIWI-102630	Managing Organizations	4,5 CP	Lindstädt
T-WIWI-113090	Strategic Management	4,5 CP	Lindstädt

Assessment
Erfolgreicher Abschluss aller fachlich entsprechenden Module aus dem Grundlagenprogramm.

Competence Goal

- Students can prepare strategic decisions along the ideal-typical strategy process and classify them strategically.
- Students evaluate the strengths and weaknesses of existing organizational structures and regulations using systematic criteria and can review the management of organizational change.
- Students can make effective decisions by structuring problems and communicating solutions, taking into account the situation and the personalities involved.
- Students learn to apply and discuss the theoretical content of the course to real-life situations through intensive engagement with a variety of practice-relevant case studies.

Content
The module has a practical and action-oriented structure. Students learn about central frameworks of strategic management along the ideal-typical strategy process. The aim is to provide an overview of basic models and to achieve action-oriented integration by transferring theory to practical issues. Students also learn concepts for designing organizational structures, regulating organizational processes and managing organizational change. This enables a well-founded assessment of existing organizational structures and regulations. Participants are also enabled to identify, structure, analyze and effectively communicate problems.

Workload
The total workload for this module is approx. 270 hours (9 credit points). The allocation is based on the credit points of the courses in the module. The workload for courses with 4.5 credit points is approx. 135 hours. The total number of hours per course results from the time required to attend the lectures and exercises, as well as the examination times and the time required to achieve the learning objectives of the module for an average student for an average performance.

6.74 Module: Supply Chain Management [M-WIWI-101421]

Coordinators: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Business and Economics
Part of: Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	3	11

Mandatory			
T-WIWI-107506	Platform Economy	4,5 CP	Weinhardt
Supplementary Courses (Election: 1 item)			
T-WIWI-102704	Facility Location and Strategic Supply Chain Management	4,5 CP	Nickel
T-WIWI-102714	Tactical and Operational Supply Chain Management	4,5 CP	Nickel

Assessment
This module is only available in the elective field. In the specialization program Business Administration, the election is not permitted.

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
The courseT-WIWI-107506 "Platform Economy"has to be taken.

Competence Goal
The students

- are able to understand and evaluate the control of cross-company supply chains based on a strategic and operative view,
- are able to analyse the coordination problems within the supply chains,
- are able to identify and integrate adequate information system infrastructures to support the supply chains,
- are able to apply theoretical methods from the operations research and the information management,
- learn to elaborate solutions in a team

Content
The module "Supply Chain Management" gives an overview of the mutual dependencies of information systems and of supply chains spanning several enterprises. The specifics of supply chains and their information needs set new requirements for the operational information management. In the core lecture "Platform Economy" the focus is set on markets between two parties that act through an intermediary on an Internet platform. Topics discussed are network effects, peer-to-peer markets, blockchains and market design. The course is held in English and teaches parts of the syllabus with the support of a case study in which students analyze a platform.

The module is completed by an elective course addressing appropriate optimization methods for the Supply Chain Management and for modern logistic approaches.

Additional Information
The planned lectures in the next terms can be found on the websites of the respective institutes IISM, IFL and IOR.

Workload
The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

6.75 Module: Team Project Management and Technology [M-WIWI-105440]

Coordinators:	Prof. Dr. Martin Klarmann Prof. Dr. Alexander Mädche
Organisation:	KIT Department of Business and Economics
Part of:	Compulsory Elective Modules (Team Project)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	3	1

Election Notes
The team project can only be credited within the elective area. Accordingly, it can be credited either in the elective block 'Business Administration or Engineering Sciences' or in the elective block 'Team Project'.

Mandatory			
T-WIWI-110968	Team Project Management and Technology	9 CP	Klarmann, Mädche

Assessment
Alternative exam assessment. The basis for grading is the documents produced, the presentations during the course of the project, the artifact to be produced (e.g. algorithm, method, model, software, component) and the final presentation.

Prerequisites
The team project can only be credited within the elective area. Accordingly, it can be credited either in the elective block 'Business Administration or Engineering Sciences' or in the elective block 'Team Project'.

Competence Goal
After successful completion of the team project, the students can:

- select and apply the methods, techniques and tools required for problem solving
- systematically analyze a given problem in an interdisciplinary team and develop and evaluate an artifact-centered solution
- constructively solve challenges and conflicts that arise in teamwork.

Content
The team project "Management and Technology" aims to prepare students for working in heterogeneously composed teams.
A team of 4-5 students will work on defined interdisciplinary questions at the interface of economics and MINT subjects. The result of the projects should typically not only be a presentation or a report, but an artifact, e.g. a method, an algorithm, a model, a software or a component.
The team projects already implement the concept of research-oriented teaching in the Bachelor's degree and aim to build up problem-solving competence in the students.

Additional Information
Participation in the "Team Project Management and Technology " course is subject to **limited capacity**. Mandatory registration must be completed through the **WIWI-Portal** at the following address: https://portal.wiwi.kit.edu/ys

Workload
The total of 270 working hours (9 credit points) per team member (4-5 members per team) are divided into the following tasks:

- communication:
    - Team meetings: 30 h (2h per week, 15 weeks),
    - Electronic exchange: 20 h,
    - Final presentation: 10
- Documentation and development:
    - Analysis and design: 70 h,
    - Development: 90 h,
    - Tests and quality assurance: 50 h

M 6.76 Module: Team Project Management and Technology (BUS/ENG) [M-WIWI-105447]

Organisation: KIT Department of Business and Economics
Part of: Compulsory Elective Modules (Business Administration oder Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	3	1

Election Notes
The team project can only be credited within the elective area. Accordingly, it can be credited either in the elective block 'Business Administration or Engineering Sciences' or in the elective block 'Team Project'.

Mandatory			
T-WIWI-110977	Team Project Management and Technology (BUS/ENG)	9 CP	Klarmann, Mädche

Assessment
Alternative exam assessment. The basis for grading is the documents produced, the presentations during the course of the project, the artifact to be produced (e.g. algorithm, method, model, software, component) and the final presentation.

Prerequisites
The team project can only be credited within the elective area. Accordingly, it can be credited either in the elective block 'Business Administration or Engineering Sciences' or in the elective block 'Team Project'.

Competence Goal
After successful completion of the team project, the students can:

- select and apply the methods, techniques and tools required for problem solving
- systematically analyze a given problem in an interdisciplinary team and develop and evaluate an artifact-centered solution
- constructively solve challenges and conflicts that arise in teamwork.

Content
The team project "Management and Technology" is carried out by a business administration or engineering institute. It aims to prepare students for working in heterogeneously composed teams.
A team of 4-5 students will work on defined interdisciplinary questions at the interface of economics and MINT subjects. The result of the projects should typically not only be a presentation or a report, but an artifact, e.g. a method, an algorithm, a model, a software or a component.
The team projects already implement the concept of research-oriented teaching in the Bachelor's degree and aim to build up problem-solving competence in the students.

Additional Information
Participation in the "Team Project Management and Technology " course is subject to **limited capacity**. Mandatory registration must be completed through the **WIWI-Portal** at the following address: https://portal.wiwi.kit.edu/ys

Workload
The total of 270 working hours (9 credit points) per team member (4-5 members per team) are divided into the following tasks:

- communication:
    - Team meetings: 30 h (2h per week, 15 weeks),
    - Electronic exchange: 20 h,
    - Final presentation: 10
- Documentation and development:
    - Analysis and design: 70 h,
    - Development: 90 h,
    - Tests and quality assurance: 50 h

M 6.77 Module: Topics in Finance I [M-WIWI-101465]

Coordinators: Prof. Dr. Martin Ruckes
Prof. Dr. Marliese Uhrig-Homburg

Organisation: KIT Department of Business and Economics

Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	3	11

Compulsory Elective Courses (Election:)			
T-WIWI-102643	Derivatives	4,5 CP	Uhrig-Homburg
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CP	Weinhardt
T-WIWI-107505	Financial Accounting for Global Firms	4,5 CP	Luedecke
T-WIWI-102623	Financial Intermediation	4,5 CP	Ruckes
T-WIWI-112694	FinTech	4,5 CP	Thimme
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CP	Gutekunst, Wigger
T-WIWI-102646	International Finance	3 CP	Uhrig-Homburg
T-WIWI-114340	Quantitative Finance	4,5 CP	Thimme

Assessment

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites

It is only possible to choose this module in combination with the module *Essentials in Finance*. The module is passed only after the final partial exam of *Essentials in Finance* is additionally passed.

In addition to that it is possible to choose the module *Topics in Finance II*.

Competence Goal

The student

- has advanced skills in modern finance
- is able to apply these skills in practice in the fields of finance and accounting, financial markets and banking

Content

The module *Topics in Finance I* is based on the module *Essentials of Finance*. The courses deal with advanced issues concerning the fields of finance and accounting, financial markets and banking from a theoretical and practical point of view.

Workload

The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

6.78 Module: Topics in Finance II [M-WIWI-101423]

Coordinators: Prof. Dr. Martin Ruckes
Prof. Dr. Marliese Uhrig-Homburg

Organisation: KIT Department of Business and Economics

Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	3	12

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-102643	Derivatives	4,5 CP	Uhrig-Homburg
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CP	Weinhardt
T-WIWI-107505	Financial Accounting for Global Firms	4,5 CP	Luedecke
T-WIWI-102623	Financial Intermediation	4,5 CP	Ruckes
T-WIWI-112694	FinTech	4,5 CP	Thimme
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CP	Gutekunst, Wigger
T-WIWI-102646	International Finance	3 CP	Uhrig-Homburg
T-WIWI-114340	Quantitative Finance	4,5 CP	Thimme

Assessment
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites
Students may only start the module *Topics in Finance II* after they have successfully completed the module *Essentials of Finance*. Exceptions are subject to approval by the examination committee; for this purpose, students must contact the examination office of the KIT Department of Economics and Management.

Competence Goal
The student

- has advanced skills in modern finance
- is able to apply these skills in practice in the fields of finance and accounting, financial markets and banking

Content
The module *Topics in Finance II* is based on the module *Essentials of Finance*. The courses deal with advanced issues concerning the fields of finance and accounting, financial markets and banking from a theoretical and practical point of view.

Workload
The total workload for this module is approximately 270 hours.

6.79 Module: Vehicle Development [M-MACH-101265]

Coordinators: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits	Grading	Recurrence	Duration	Language	Level	Version
9 CP	graded	Each term	1 term	German/English	4	10

Vehicle Development (Election: at least 9 credits)			
T-MACH-102207	Tires and Wheel Development for Passenger Cars	3 CP	Leister
T-MACH-111389	Fundamentals in the Development of Commercial Vehicles	3 CP	Weber
T-MACH-102156	Project Workshop: Automotive Engineering	4,5 CP	Frey, Gießler
T-MACH-110796	Python Algorithms for Vehicle Technology	4 CP	Rhode
T-MACH-102148	Gear Cutting Technology	4 CP	Klaiber
T-MACH-112126	Data-Driven Algorithms in Vehicle Technology	4 CP	Scheubner
T-MACH-114075	Principles of Whole Vehicle Engineering (in German)	4 CP	Harrer
T-MACH-114095	Principles of Whole Vehicle Engineering	4 CP	Harrer
T-MACH-113862	Simulation with Lumped Parameters	3 CP	Geimer
T-MACH-113863	Tutorial Simulation with Lumped Parameters	1 CP	Geimer

Assessment
The assessment is carried out as partial exams.

The partial exams consists of a written exam (90 to 120 minutes) or an oral exam (duration 30 to 40 minutes).

Prerequisites
None

Competence Goal
The student

- knows and understands the procedures in automobile development,
- knows and understands the technical specifications at the development procedures,
- is aware of notable boundaries like legislation.

Content
By taking the module Vehicle Development the students get to know the methods and processes applied in the automobile industry. They learn the technical particularities which have to be considered during the vehicle development and it is shown how the numerous single components cooperate in a harmoniously balanced complete vehicle. There is also paid attention on special boundary conditions like legal requirements.

Workload
The total work load for this module is about 270 Hours (9 Credits). The partition of the work load is carried out according to the credit points of the courses of the module. The work load for courses with 6 credit points is about 180 hours, for courses with 4.5 credit points about 135 hours, for courses with 3 credit points about 90 hours, and for courses with 1.5 credit points about 45 hours. The total number of hours per course results from the time of visiting the lectures and exercises, as well as from the exam duration and the time that is required to achieve the objectives of the module as an average student with an average performance.

Recommendations
Knowledge of the content of the courses *Engineering Mechanics I* [2161238], *Engineering Mechanics II* [2162276] and *Basics of Automotive Engineering I* [2113805], *Basics of Automotive Engineering II* [2114835] is helpful.

Teaching and Learning Methods
The teaching and learning procedures (lecture, lab course, workshop) are described for each course of the module separately.

7 Module components

7.1 Module component: Additive Manufacturing of Metallic Components [T-MACH-113985]

Coordinators: Prof. Dr.-Ing. Frederik Zanger
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Expansion	Version
Oral examination	4 CP	graded	Each winter term	1 semesters	2

Courses					
WT 25/26	2149671	Additive Manufacturing of Metallic Components	2 SWS	Lecture / 🗣	Zanger
Exams					
WT 25/26	76-T-MACH-113985	Additive Manufacturing of Metallic Components			Zanger

Legend: Online, Blended (On-Site/Online), 🗣 On-Site, × Cancelled

Assessment
Oral examination, duration approx. 30 minutes

Prerequisites
The following module component may not have started:

- T-MACH-114019 - Additive Fertigung metallischer Bauteile: Designoptimierung und Herstellung

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Additive Manufacturing of Metallic Components

2149671, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

The course “Additive Manufacturing of Metallic Components” teaches the theoretical fundamentals of metallic additive manufacturing, particularly using the example of the laser-based process powder bed fusion (PBF-LB/M). It thus provides the ideal prerequisite for the course “Project Internship Additive Manufacturing: Design Optimization and Manufacturing of Metallic Components.”

The course covers the underlying mechanisms and the necessary steps in the additive process chain for metallic components. Other processes for manufacturing metallic components using additive manufacturing methods are also discussed. Students will learn about the following topics:

- Structure and function of a PBF-LB/M system
- Influence of process parameters on the quality of components manufactured in the PBF-LB/M process
- Design for additive manufacturing
- Options for simulation assistance in the process chain
- Process monitoring and quality assurance in additive manufacturing
- Downstream processes for adjusting the required component state
- Quality control in additive manufacturing
- Fundamentals and possibilities of directed energy deposition, binder jetting, and bath-based photopolymerization processes.

Learning Outcomes:

Students ...

- are able to explain the basic principles of the laser-based additive manufacturing processes powder bed fusion and directed energy deposition, as well as the two processes binder jetting and bath-based photopolymerization.
- can describe the characteristics and areas of application of the four processes mentioned above.
- can describe the creation of a product along the entire additive process chain (CAD, simulation, construction job preparation, CAM) from the initial idea to production using the example of the powder bed fusion process.
- are able to discuss the development process for components that are optimized for additive manufacturing.
- can explain in detail the mechanisms behind the powder bed fusion process and derive measures for improving the process.
- can evaluate and select options for post-processing additively manufactured components based on their requirements.
- are able to name the most important methods for quality assurance in additive manufacturing and the relevant standards.

Workload:

regular attendance: 21 hours
self-study: 99 hours

Literature

Medien:

Skript zur Veranstaltung wird über ilias (https://ilias.studium.kit.edu/) bereitgestellt.

Media:

Lecture notes will be provided in ilias (https://ilias.studium.kit.edu/).

T 7.2 Module component: Additive Manufacturing Processes [T-MACH-113570]

Coordinators: Prof. Dr.-Ing. Frederik Zanger
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-101276 - Manufacturing Technology

Type	Credits	Grading	Term offered	Expansion	Version
Oral examination	4 CP	graded	Each summer term	1 semesters	1

Courses					
ST 2026	2150702	Additive Manufacturing Processes	3 SWS	Lecture / 🗣	Zanger

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral examination, duration approx. 20 minutes

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Additive Manufacturing Processes

2150702, SS 2026, 3 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

The course “Additive Manufacturing Processes” provides participants with in-depth knowledge of industrially relevant additive manufacturing processes and their process chains. During the course, students learn the theoretical principles and practical application aspects of the following processes:

MEX: Material extrusion
MJT: Material jetting
PBF: Powder bed fusion
BJT: Binder jetting
DED: Directed energy deposition
VPP: Vat photopolymerization.

In addition, the following topics are covered:

Holistic view of the process chain
Materials for additive manufacturing processes (production and characterisation)
Design methods and simulation in additive manufacturing
Future trends and innovative technologies.

The acquired knowledge is supplemented by practical lectures from industry, which offer valuable insights into current applications, challenges and innovations in additive manufacturing.

Learning Outcomes:

Students ...

can describe the principles and special features of industrially relevant additive manufacturing technologies
are able to explain the process of layer formation in additive manufacturing processes and evaluate it in terms of manufacturing possibilities
can describe the various methods of powder production and assess their advantages and disadvantages in relation to additive manufacturing
can name the essential materials for additive manufacturing, explain their properties and analyse their fields of application
are able to explain additive process chains, including heat treatment, post-processing and quality assurance, and to evaluate their significance for component quality.
can take into account the design requirements and process-specific features of additive manufacturing in component development
are able to classify current research and development topics in the field of additive manufacturing in the context of industrial applications

Workload:

regular attendance: 21 hours
self-study: 99 hours

Organizational issues

Bekanntgabe von möglichen Praxisvorlesungen erfolgt in der ersten Vorlesung

Literature

Medien:

Skript zur Veranstaltung wird über ilias (https://ilias.studium.kit.edu/) bereitgestellt.

Media:

Lecture notes will be provided in ilias (https://ilias.studium.kit.edu/).

T 7.3 Module component: Advanced Lab Blockchain Hackathon (Bachelor) [T-WIWI-111127]

Coordinators: Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101426 - Electives in Informatics

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	see Annotations	1

Assessment
The examination will no longer be offered from summer semester 2025.

Prerequisites
None

Additional Information
The course is no longer offered.

Workload
135 hours

T 7.4 Module component: Advanced Lab Informatics (Bachelor) [T-WIWI-110541]

Coordinators: Professorenschaft des Instituts AIFB
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101426 - Electives in Informatics

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each term	1

Courses					
WT 25/26	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / Blended	Schiefer, Toussaint
WT 25/26	2512554	Praktikum Security, Usability and Society (Bachelor)	3 SWS	Practical course / Blended	Volkamer, Strufe, Berens, Fallahi, Ballreich, Hennig, Länge, Mossano, Hilt
ST 2026	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / On-Site	Schiefer, Toussaint, Kruse
ST 2026	2512206	Lab Agentic AI im Smart IoT Office (Bachelor)	3 SWS	Practical course / On-Site	Oberweis, Rybinski, Ullrich
ST 2026	2512554	Practical Course: Security, Usability and Society	3 SWS	Practical course / Blended	Volkamer, Strufe, Hennig, Länge, Fallahi, Ballreich, Sikra, Hilt, Reimer, Algedri, Mack

Exams			
WT 25/26	7900042	Advanced Lab Programming 3 (Bachelor)	Oberweis
WT 25/26	7900047	Advanced Lab Realization of Innovative Services (Bachelor)	Oberweis
WT 25/26	7900116	Advanced Lab Security, Usability and Society (Bachelor)	Volkamer
ST 2026	7900029	Practical lab Security, Usability and Society (Bachelor)	Volkamer, Strufe
ST 2026	7900032	Advanced Lab Agentic AI im Smart IoT Office (Bachelor)	Oberweis
ST 2026	7900085	Advanced Lab Realization of innovative services (Bachelor)	Oberweis, Schiefer

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Assessment
The alternative exam assessment consists of:

- a practical work
- a presentation and
- a written seminar thesis

Practical work, presentation and written thesis are weighted according to the course.

Prerequisites
None

Additional Information
The title of this course is a generic one. Specific titles and the topics of offered seminars will be announced before the start of a semester in the internet at https://portal.wiwi.kit.edu.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Lab Realisation of innovative services (Bachelor)
2512204, WS 25/26, 3 SWS, Language: German, Open in study portal

Practical course (P)
Blended (On-Site/Online)

Content
As part of the lab, the participants should work together in small groups to realize innovative services (mainly for students).

Organizational issues
Informationen zu Themen und die Anmeldung erfolgt vor Praktikumsbeginn im Wiwi-Portal
https://portal.wiwi.kit.edu/ys

V	**Praktikum Security, Usability and Society (Bachelor)** 2512554, WS 25/26, 3 SWS, Language: English, Open in study portal	**Practical course (P)** **Blended (On-Site/Online)**

Content
In the lab course "Security, Usability and Society", students explore practical and interdisciplinary topics in the field of IT security and privacy at the cutting edge of society. In addition to the programming of data-saving apps, the development or implementation of user studies can also be possible tasks in this course.

The course can be credited towards the KASTEL certificate. Further information about the KASTEL certificate can be found on the SECUSO website: https://secuso.aifb.kit.edu/Studium_und_Lehre.php

Prerequisites:

The internship is aimed at Bachelor's and Master's students from the Industrial Engineering and Management, Business Informatics and Computer Science degree programs as well as related degree programs.

Organization:

There are two **mandatory** attendance dates: The kick-off is scheduled for the first week of the lectures, and the final presentations will take place in the second-to-last week of lectures. Additional dates will be arranged individually with the supervisors. All in-person lectures will be held in English. The main components of the course are the work on the respective topic, a final presentation, and a final report. After consultation with the supervisor, all components can be completed in either German or English.

Please note: In-person attendance at the kick-off and final presentation is mandatory to be allocated a topic.

If you have any questions about the course or the registration, please contact contact@secuso.org.

Registration:

The topics for the course, as well as the registration, are organized via the WiWi Portal. To reserve a place and select a topic, students register for the course in the WiWi Portal. A description of the current topics as well as important dates and deadlines can also be found there.

Please note that the number of topics is limited, and topics are allocated in the order of registration.

V	**Lab Realisation of innovative services (Bachelor)** 2512204, SS 2026, 3 SWS, Language: German, Open in study portal	**Practical course (P)** **On-Site**

Content
As part of the lab, the participants should work together in small groups to realize innovative services (mainly for students).

Organizational issues
Informationen zu Themen und die Anmeldung erfolgt bis Mitte März im Wiwi-Portal
https://portal.wiwi.kit.edu/ys

V	**Lab Agentic AI im Smart IoT Office (Bachelor)** 2512206, SS 2026, 3 SWS, Language: German, Open in study portal	**Practical course (P)** **On-Site**

Content
As part of the lab, various topics on everyday automation are offered. During the lab, the participants will gain an insight into problem-solving oriented project work and work on a project together in small groups.

In case of questions, please contact fabian.rybinski@kit.edu.

Organizational issues
Informationen zu Themen und die Anmeldung erfolgt vor Praktikumsbeginn im Wiwi-Portal
https://portal.wiwi.kit.edu/ys

Bei Fragen bitte an fabian.rybinski@kit.edu wenden.

V	**Practical Course: Security, Usability and Society** 2512554, SS 2026, 3 SWS, Language: English, Open in study portal	**Practical course (P)** **Blended (On-Site/Online)**

Content

In the lab-course “Security, Usability and Society”, students deal with practical and interdisciplinary topics from the field of IT security and privacy at the cutting edge of society. In addition to the programming of data-saving apps, the development or implementation of user studies can also be possible tasks in this course.

The course can be credited towards the KASTEL certificate. Further information about the KASTEL certificate can be found on the SECUSO website: https://secuso.aifb.kit.edu/Studium_und_Lehre.php

Prerequisites:

The internship is aimed at Bachelor's and Master's students from the Industrial Engineering and Management, Business Informatics and Computer Science degree programs as well as related degree programs.

Organization:

There are two mandatory attendance dates: The kick-off is scheduled for the first week of the lectures, and the final presentations will take place in the second to last week of lectures. Additional dates will be arranged individually with the supervisors. All in-person lectures will be held in English. The main components of the course is the work on the respective topic, a final presentation and a final report. After consultation with the supervisor, all components can be either completed in German or English.

If you have any questions about the course or the registration, please contact contact@secuso.org.

Registration:

The topics for the course as well as the registration is organized via the WiWi-Portal. To reserve a place and choose a topic, students register for the course in the WiWi-Portal. A description of the current topics as well as important dates and deadlines can also be found there.

Please note that the number of topics is limited and topics are allocated in the order of registration.

T 7.5 Module component: Advanced Lab Programming 3 [T-WIWI-114597]

Coordinators: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101426 - Electives in Informatics

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2512208	Lab Programming 3 (Bachelor)	3 SWS	Practical course / 🗣	Oberweis, Fritsch, Forell, Rybinski, Kruse
Exams					
WT 25/26	7900042	Advanced Lab Programming 3 (Bachelor)			Oberweis

Legend: 🖥 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment of this course are practical work, presentations and a written thesis according to §4(2), 3 of the examination regulation. Practical work, presentations and a written thesis are weighted according to the course.

Prerequisites
None

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Lab Programming 3 (Bachelor)

2512208, WS 25/26, 3 SWS, Language: German, Open in study portal

Practical course (P)
On-Site

Content
Registration information and the content of the lab will be announced on the WIWI-portal. Only bachelor students are allowed to attend.

T 7.6 Module component: Advanced Lab Realization of Innovative Services (Bachelor) [T-WIWI-112915]

Coordinators: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101426 - Electives in Informatics

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each term	1

Courses					
WT 25/26	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / Blended	Schiefer, Toussaint
ST 2026	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / On-Site	Schiefer, Toussaint, Kruse
Exams					
WT 25/26	7900047	Advanced Lab Realization of Innovative Services (Bachelor)			Oberweis
ST 2026	7900085	Advanced Lab Realization of innovative services (Bachelor)			Oberweis, Schiefer

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Assessment
The alternative exam assessment consists of:

- a practical work
- a presentation and
- a written seminar thesis

Practical work, presentation and written thesis are weighted according to the course.

Additional Information
As part of the lab, the participants should work together in small groups to produce innovative services (mainly for students).

Further information can be found on the ILIAS page of the lab.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Lab Realisation of innovative services (Bachelor)
2512204, WS 25/26, 3 SWS, Language: German, Open in study portal

Practical course (P)
Blended (On-Site/Online)

Content
As part of the lab, the participants should work together in small groups to realize innovative services (mainly for students).

Organizational issues
Informationen zu Themen und die Anmeldung erfolgt vor Praktikumsbeginn im Wiwi-Portal
https://portal.wiwi.kit.edu/ys

V Lab Realisation of innovative services (Bachelor)
2512204, SS 2026, 3 SWS, Language: German, Open in study portal

Practical course (P)
On-Site

Content
As part of the lab, the participants should work together in small groups to realize innovative services (mainly for students).

Organizational issues
Informationen zu Themen und die Anmeldung erfolgt bis Mitte März im Wiwi-Portal
https://portal.wiwi.kit.edu/ys

T 7.7 Module component: Advanced Lab Security, Usability and Society [T-WIWI-108439]

Coordinators: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101426 - Electives in Informatics

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each term	3

Courses					
WT 25/26	2512554	Praktikum Security, Usability and Society (Bachelor)	3 SWS	Practical course / Blended	Volkamer, Strufe, Berens, Fallahi, Ballreich, Hennig, Länge, Mossano, Hilt
WT 25/26	2512555	Praktikum Security, Usability and Society (Master)	3 SWS	Practical course / Blended	Volkamer, Strufe, Berens, Fallahi, Ballreich, Hennig, Länge, Mossano, Hilt
ST 2026	2512554	Practical Course: Security, Usability and Society	3 SWS	Practical course / Blended	Volkamer, Strufe, Hennig, Länge, Fallahi, Ballreich, Sikra, Hilt, Reimer, Algedri, Mack
ST 2026	2512555	Praktikum Security, Usability and Society (Master)	3 SWS	Practical course / Blended	Volkamer, Strufe, Hennig, Fallahi, Länge, Ballreich, Hilt, Sikra, Algedri, Reimer, Mack
Exams					
WT 25/26	7900116	Advanced Lab Security, Usability and Society (Bachelor)			Volkamer
WT 25/26	7900307	Advanced Lab Security, Usability and Society (Master)			Volkamer
ST 2026	7900029	Practical lab Security, Usability and Society (Bachelor)			Volkamer, Strufe

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Assessment takes the form of an alternative exam. It consists of a practical assignment, a presentation, and, if required, a written report. The lectures and the presentations will be in English. The written report can be written in either English or German after consultation with the supervisor.
Practical work, presentation, and written thesis are weighted according to the course.

Prerequisites
None

Recommendations
Knowledge from the lecture "Applied Informatics - Cybersecurity" is recommended.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Praktikum Security, Usability and Society (Bachelor)
2512554, WS 25/26, 3 SWS, Language: English, Open in study portal

Practical course (P)
Blended (On-Site/Online)

Content

In the lab course “Security, Usability and Society”, students explore practical and interdisciplinary topics in the field of IT security and privacy at the cutting edge of society. In addition to the programming of data-saving apps, the development or implementation of user studies can also be possible tasks in this course.

The course can be credited towards the KASTEL certificate. Further information about the KASTEL certificate can be found on the SECUSO website: https://secuso.aifb.kit.edu/Studium_und_Lehre.php

Prerequisites:

The internship is aimed at Bachelor's and Master's students from the Industrial Engineering and Management, Business Informatics and Computer Science degree programs as well as related degree programs.

Organization:

There are two **mandatory** attendance dates: The kick-off is scheduled for the first week of the lectures, and the final presentations will take place in the second-to-last week of lectures. Additional dates will be arranged individually with the supervisors. All in-person lectures will be held in English. The main components of the course are the work on the respective topic, a final presentation, and a final report. After consultation with the supervisor, all components can be completed in either German or English.

Please note: In-person attendance at the kick-off and final presentation is mandatory to be allocated a topic.

If you have any questions about the course or the registration, please contact contact@secuso.org.

Registration:

The topics for the course, as well as the registration, are organized via the WiWi Portal. To reserve a place and select a topic, students register for the course in the WiWi Portal. A description of the current topics as well as important dates and deadlines can also be found there.

Please note that the number of topics is limited, and topics are allocated in the order of registration.

V **Praktikum Security, Usability and Society (Master)**
2512555, WS 25/26, 3 SWS, Language: English, Open in study portal

Practical course (P)
Blended (On-Site/Online)

Content

In the lab course “Security, Usability and Society”, students explore practical and interdisciplinary topics in the field of IT security and privacy at the cutting edge of society. In addition to the programming of data-saving apps, the development or implementation of user studies can also be possible tasks in this course.

The course can be credited towards the KASTEL certificate. Further information about the KASTEL certificate can be found on the SECUSO website: https://secuso.aifb.kit.edu/Studium_und_Lehre.php

Prerequisites:

The internship is aimed at Bachelor's and Master's students from the Industrial Engineering and Management, Business Informatics and Computer Science degree programs as well as related degree programs.

Organization:

There are two **mandatory** attendance dates: The kick-off is scheduled for the first week of the lectures, and the final presentations will take place in the second-to-last week of lectures. Additional dates will be arranged individually with the supervisors. All in-person lectures will be held in English. The main components of the course are the work on the respective topic, a final presentation, and a final report. After consultation with the supervisor, all components can be completed in either German or English.

Please note: In-person attendance at the kick-off and final presentation is mandatory to be allocated a topic.

If you have any questions about the course or the registration, please contact contact@secuso.org.

Registration:

The topics for the course, as well as the registration, are organized via the WiWi Portal. To reserve a place and select a topic, students register for the course in the WiWi Portal. A description of the current topics as well as important dates and deadlines can also be found there.

Please note that the number of topics is limited, and topics are allocated in the order of registration.

V **Practical Course: Security, Usability and Society**
2512554, SS 2026, 3 SWS, Language: English, Open in study portal

Practical course (P)
Blended (On-Site/Online)

Content

In the lab-course “Security, Usability and Society”, students deal with practical and interdisciplinary topics from the field of IT security and privacy at the cutting edge of society. In addition to the programming of data-saving apps, the development or implementation of user studies can also be possible tasks in this course.

The course can be credited towards the KASTEL certificate. Further information about the KASTEL certificate can be found on the SECUSO website: https://secuso.aifb.kit.edu/Studium_und_Lehre.php

Prerequisites:

The internship is aimed at Bachelor's and Master's students from the Industrial Engineering and Management, Business Informatics and Computer Science degree programs as well as related degree programs.

Organization:

There are two mandatory attendance dates: The kick-off is scheduled for the first week of the lectures, and the final presentations will take place in the second to last week of lectures. Additional dates will be arranged individually with the supervisors. All in-person lectures will be held in English. The main components of the course is the work on the respective topic, a final presentation and a final report. After consultation with the supervisor, all components can be either completed in German or English.

If you have any questions about the course or the registration, please contact contact@secuso.org.

Registration:

The topics for the course as well as the registration is organized via the WiWi-Portal. To reserve a place and choose a topic, students register for the course in the WiWi-Portal. A description of the current topics as well as important dates and deadlines can also be found there.

Please note that the number of topics is limited and topics are allocated in the order of registration.

V	**Praktikum Security, Usability and Society (Master)** 2512555, SS 2026, 3 SWS, Language: English, Open in study portal	**Practical course (P)** **Blended (On-Site/Online)**

Content

In the lab-course “Security, Usability and Society”, students deal with practical and interdisciplinary topics from the field of IT security and privacy at the cutting edge of society. In addition to the programming of data-saving apps, the development or implementation of user studies can also be possible tasks in this course.

The course can be credited towards the KASTEL certificate. Further information about the KASTEL certificate can be found on the SECUSO website: https://secuso.aifb.kit.edu/Studium_und_Lehre.php

Prerequisites:

The internship is aimed at Bachelor's and Master's students from the Industrial Engineering and Management, Business Informatics and Computer Science degree programs as well as related degree programs.

Organization:

There are two mandatory attendance dates: The kick-off is scheduled for the first week of the lectures, and the final presentations will take place in the second to last week of lectures. Additional dates will be arranged individually with the supervisors. All in-person lectures will be held in English. The main components of the course is the work on the respective topic, a final presentation and a final report. After consultation with the supervisor, all components can be either completed in German or English.

If you have any questions about the course or the registration, please contact contact@secuso.org.

Registration:

The topics for the course as well as the registration is organized via the WiWi-Portal. To reserve a place and choose a topic, students register for the course in the WiWi-Portal. A description of the current topics as well as important dates and deadlines can also be found there.

Please note that the number of topics is limited and topics are allocated in the order of registration.

T 7.8 Module component: Advanced Lab Sociotechnical Information Systems Development (Bachelor) [T-WIWI-111124]

Coordinators: Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101426 - Electives in Informatics

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	see Annotations	1

Assessment
The examination will no longer be offered from summer semester 2025.

Prerequisites
None

Additional Information
The course is no longer offered.

Workload
135 hours

T 7.9 Module component: Advanced Programming - Application of Business Software [T-WIWI-102748]

Coordinators: Prof. Dr. Stefan Klink
Prof. Dr. Andreas Oberweis
Dr.-Ing. Clemens Schreiber
Dr.-Ing. Meike Ullrich

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-105112 - Applied Informatics

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	3

Courses					
WT 25/26	2511026	Advanced Programming - Application of Business Software	2 SWS	Lecture / 🗣	Ullrich
WT 25/26	2511027	Exercises Advanced Programming - Application of Business Software	1 SWS	Practice / 🗣	Ullrich
WT 25/26	2511028	Computer lab Advanced Programming - Application of Business Software	2 SWS	Practice / 🖥	Ullrich
Exams					
WT 25/26	7900019	Advanced Programming - Application of Business Software			Oberweis, Ullrich, Schreiber
ST 2026	7900049	Advanced Programming - Application of Business Software			Klink, Ullrich, Schreiber

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The success control takes place in the form of a written examination. The duration of the exam is 60 minutes. The examination is offered every semester and can be repeated at any regular examination date.
The prerequisite for taking the exam is successful participation in a computer lab during the lecture in the winter semester. Attendance is compulsory for individual dates of the computer lab. More detailed information on registration to the computer lab and exercise sessions will be announced in the first lecture and on the lecture homepage on ILIAS.
Admission to take the exam can only be acquired in the winter semester and is valid indefinitely.

Prerequisites
This course cannot be taken together with *Advanced Programming - Java Network Programming.*

Recommendations
Knowledge of the course "Foundations of Informatics I und II" are helpful.

Workload
150 hours

Below you will find excerpts from courses related to this module component:

V Advanced Programming - Application of Business Software

Lecture (V)
On-Site

2511026, WS 25/26, 2 SWS, Language: German, Open in study portal

Content

Business (or Enterprise) Information Systems (BIS), which are often implemented as standard software, form the backbone of modern organizations. They enable, support, and accelerate digital business processes and new forms of collaboration. In an era of platform economies, data-driven decision-making, and hybrid work models, BIS constitute a central infrastructure for economic activity.

This course provides theoretical and practical foundations for the design, adaptation, and implementation of enterprise information systems. Through lectures, exercises, and practical computer sessions, students acquire in-depth knowledge in the following areas:

- Advantages and disadvantages of business standard software, as well as selection criteria
- Modeling and analysis of business processes with standard software
- Types and application areas of business information systems
- Methods and challenges related to the introduction of standard software
- Sustainability in the context of of business information systems

This course cannot be taken together with *Advanced Programming - Java Network Programming* [2511020].

Learning objectives:

Students

- explain fundamental concepts, criteria, and application areas of information systems,
- identify and describe types and components of information systems,
- apply standard software to model, analyze, and evaluate business processes using exemplary scenarios,
- analyze the implementation, use, and impact of business standard software.

Recommendations:

Knowledge of the courses "Grundlagen der Informatik I und II" are helpful.

Notes:

- No registration is required for the lecture
- An registration is required for the exercises for participation in the Computer Lab and the subsequent exam admission
- The registration phase for the exercises starts in the first week after lecture begin and ends with the first exercise session
- Important informations regarding the registration, exact dates and deadlines will be communicated on the lecture website (ILIAS)

Workload:

- Lecture 30h
- Exercise course 15h
- Review and preparation of lectures 23h
- Review and preparation of exercises 10h
- Computer Lab 30h
- Exam preparation 26h
- Exam 1h
- Total 135h
- Exercise courses are done by student tutors

Literature

- Schönthaler, Vossen, Oberweis, Karle: Business Processes for Business Communities: Modeling Languages, Methods, Tools. Springer 2012.
- Hasenkamp, Stahlknecht: Einführung in die Wirtschaftsinformatik. Springer 2012.
- Hansen, Neumann: Wirtschaftsinformatik I. Grundlagen betrieblicher Informationsverarbeitung. UTB 2009.
- Mertens et al.: Grundzüge der Wirtschaftsinformatik. Springer 2012.

Weitere Literatur wird in der Vorlesung bekannt gegeben.

T 7.10 Module component: Advanced Programming - Java Network Programming [T-WIWI-102747]

Coordinators: Prof. Dr. Dietmar Ratz
Prof. Dr.-Ing. Johann Marius Zöllner
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-105112 - Applied Informatics

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	6

Courses					
ST 2026	2511020	Advanced Programming - Java Network Programming	2 SWS	Lecture / 🗣	Ratz
ST 2026	2511021	Übungen zu Programmierung kommerzieller Systeme - Anwendungen in Netzen mit Java	1 SWS	Practice / 🗣	Ratz, Stegmaier, Boualili
ST 2026	2511023	Rechnerpraktikum zu Programmierung kommerzieller Systeme - Anwendungen in Netzen mit Java	2 SWS	/ 🗣	Ratz, Stegmaier, Boualili
Exams					
WT 25/26	7900020	Advanced Programming - Java Network Programming			Ratz
ST 2026	7900041	Advanced Programming - Java Network Programming			Ratz

Legend: 📱 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
At the end of the lecture period, a written examination (90 min.) is offered (according to §4(2), 1 SPO), for which - through successful participation in the exercises during the semester - admission must be obtained. The exact details will be announced in the lecture. The examination is offered every semester and can be repeated at any regular examination date.

A bonus can be earned through successful participation in the exercises. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). Details will be announced in the lecture

Prerequisites
This course cannot be taken together with Advanced Programming - Application of Business Software [2511026].

Additional Information
The registration for the participation in the computer lab (precondition for the exam participation) already takes place in the first lecture week!

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Advanced Programming - Java Network Programming

Lecture (V)
On-Site

2511020, SS 2026, 2 SWS, Language: German, Open in study portal

Content
In the lecture, the exercises and computer labs to this course the practical handling with the programming language Java dominating within the range of economical applications is obtained. The basis for this is the current language standard. The knowledge from the lecture Introduction to Programming with Java will be deepened and extended. This is done, among other things, by addressing commercially relevant topics such as object-oriented modeling and programming, class hierarchy and inheritance, threads, applications and applets, AWT and Swing components for graphical user interfaces, exception and event processing, lambda expressions, input/output via streams, applications in networks, Internet communication, client and server programming, remote method invocation, servlets, Java Server Pages and Enterprise Java Beans.

This course cannot be taken together with *Advanced Programming - Application of Business Software* [2540886/2590886].

Learning objectives:

- Students learn the practical use of the object-oriented programming language Java and are enabled to design and implement component-based Internet applications using the latest technologies and tools.
- The ability to select and design these methods and systems appropriate to the situation and to use them for solving problems is imparted.
- Students are empowered to find strategic and creative answers in the search for solutions to well-defined, concrete and abstract problems.

Workload:

The total workload for this course is approximately 150 hours.

Organizational issues
Die Anmeldung zur Teilnahme am Rechnerpraktikum (Vorbedingung zur Klausurteilnahme) findet bereits in der ersten Vorlesungswoche statt!

Literature
Ratz, D. Schulmeister-Zimolong, D. Seese, J. Wiesenberger. Grundkurs Programmieren in Java. 9. Aktualisierte und erweiterte Auflage, Hanser 2024.

Weiterführende Literatur:

- S. Zakhour, S. Hommel, J. Royal. Das Java Tutorial. Addison Wesley 2007
- W. Eberling, J. Lessner. Enterprise JavaBeans 3. Hanser Verlag 2007.
- R. Oechsle. Parallele und verteilte Anwendungen. 2. Auflage. Hanser Verlag 2007.
- Weitere Literatur wird in der Vorlesung bekannt gegeben.

T 7.11 Module component: Advanced Topics in Economic Theory [T-WIWI-102609]

Coordinators: Prof. Dr. Johannes Brumm
Prof. Dr. Kay Mitusch
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101501 - Economic Theory

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Irregular	1

Assessment
The assessment consists of a written exam (60min) (following §4(2), 1 of the examination regulation) at the end of the lecture period or at the beginning of the following semester.

Prerequisites
None

Recommendations
This course is designed for advanced Master students with a strong interest in economic theory and mathematical models. Bachelor students who would like to participate are free to do so, but should be aware that the level is much more advanced than in other courses of their curriculum.

T 7.12 Module component: Analalysis of Social Structurs (WiWi) [T-GEISTSOZ-109047]

Coordinators: Prof. Dr. Gerd Nollmann
Organisation: KIT Department of Humanities and Social Sciences
Part of: M-GEISTSOZ-101167 - Sociology/Empirical Social Research

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each winter term	1

Courses					
WT 25/26	5011004	Analysis of Social Structures	2 SWS	Lecture / 🖥	Nollmann
WT 25/26	5011007	Analysis of Social Structures	2 SWS	Practice / 🖥	Nollmann
Exams					
WT 25/26	7400029	Analalysis of Social Structurs (WiWi)			Nollmann

Legend: 🖥 Online, Blended (On-Site/Online), On-Site, × Cancelled

T 7.13 Module component: Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines [T-MACH-105173]

Coordinators: Dr.-Ing. Marcus Gohl
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101303 - Combustion Engines II

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each summer term	1

Courses					
ST 2026	2134150	Gas, lubricating oil and operating media analysis in drive train development	2 SWS	Lecture / 🗣	Gohl
Exams					
ST 2026	76-T-Mach-105173	Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines			Gohl

Legend: 🖥 Online, ⚄ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral examination, duration approx. 25 min, no aids

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Gas, lubricating oil and operating media analysis in drive train development
2134150, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Literature
Die Vorlesungsunterlagen werden vor jeder Veranstaltung an die Studenten verteilt.

T 7.14 Module component: Analysis of Multivariate Data [T-WIWI-103063]

Coordinators: Prof. Dr. Oliver Grothe
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101599 - Statistics and Econometrics
M-WIWI-105414 - Statistics and Econometrics II

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Irregular	1

Exams			
WT 25/26	7900297	Analysis of Multivariate Data	Grothe

Assessment
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. The exam is offered every semester. Re-examinations are offered only for repeaters.

Prerequisites
None

Recommendations
Attendance of the courses Statistics 1 [2600008] and Statistics 2 [2610020] is recommended.

Additional Information
The lecture is not offered regularly. The courses planned for three years in advance can be found online.

Workload
135 hours

T 7.15 Module component: Analysis Tools for Combustion Diagnostics [T-MACH-105167]

Coordinators: Jürgen Pfeil
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101303 - Combustion Engines II

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each summer term	1

Courses					
ST 2026	2134134	Analysis tools for combustion diagnostics	2 SWS	Lecture / 🗣	Pfeil
Exams					
WT 25/26	76-T-MACH-105167	Analysis Tools for Combustion Diagnostics			Koch
ST 2026	76-T-MACH-105167	Analysis Tools for Combustion Diagnostics			Pfeil

Legend: 🖥 Online, ✲ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral examination, Duration: 25 min., no auxiliary means

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Analysis tools for combustion diagnostics

2134134, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

T 7.16 Module component: Applied Data Science and Machine Learning in Engineering [T-MACH-115042]

Coordinators: Prof. Dr.-Ing. Anne Meyer
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-107658 - Data Driven Engineering Fundamentals

Type	Credits	Grading	Term offered	Expansion	Version
Examination of another type	4 CP	graded	Each summer term	1 semesters	1

Courses					
ST 2026	2122352	Applied Data Science and Machine Learning in Engineering	4 SWS	Others / 🗣	Meyer

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Graded examination of another type; for further information, see ILIAS.

Prerequisites
“Data Science Fundamentals in Engineering”, “Grundlagen der Künstlichen Intelligenz ” or a comparable course must be passed.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Applied Data Science and Machine Learning in Engineering

2122352, SS 2026, 4 SWS, Language: English, Open in study portal

Others (sonst.)
On-Site

Content

Data-driven methods are transforming modern engineering, enabling smarter product design, more efficient production systems, and intelligent robotics. To prepare students for these challenges, this course emphasizes the applied, technical aspects of data-driven engineering.

Building on prior courses introducing data science and machine learning (see prerequisites), core content includes technical aspects of industrial data sources (e.g., database technologies, REST APIs), messaging technologies (e.g., MQTT), version control (e.g., git with GitLab), and server or cluster-based computations for scalable data processing (e.g., HPC at KIT). Students practice through guided exercises and work in small groups on applied machine learning case studies using real-world engineering data from our lab. The module also covers methods for model explainability and interpretability to support transparent decision-making in engineering applications.

The course is designed as an on-site project with regular in-person collaboration and close supervision, offering students continuous, structured, and individualized feedback on their code and technical implementation.

Prerequisite

“Data Science Fundamentals in Engineering”, “Grundlagen der Künstlichen Intelligenz ” or a comparable course must be passed.

Learning Objectives

After successful completion of the module, students are able to:

- **Apply** advanced data science and machine learning methods to engineering data sets, including data from industrial sources and streaming technologies.
- **Design and implement** data analysis and machine learning workflows using collaborative tools, version control, and cluster-based computing.
- **Analyze, interpret, and evaluate** the performance and limitations of machine learning models in applied engineering scenarios.

Additional Information

The number of participants is limited. Information on the application process is available in ILIAS.

Organizational Information

See further details on course organization at: lehre.imi.kit.edu and in ILIAS.

Workload

120 hours

Organizational issues

See ILIAS for time and location

T 7.17 Module component: Applied Informatics – Applications of Artificial Intelligence [T-WIWI-110340]

Coordinators: Dr.-Ing. Tobias Käfer
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101426 - Electives in Informatics
M-WIWI-105112 - Applied Informatics

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	2

Courses					
WT 25/26	2511314	Applied Informatics - Applications of Artificial Intelligence	2 SWS	Lecture / Blended	Käfer, Kinder, Li
WT 25/26	2511315	Exercises to Applied Informatics - Applications of Artificial Intelligence	1 SWS	Practice / On-Site	Käfer, Kinder, Li
Exams					
WT 25/26	79AIFB_AKI_C1	Applied Informatics – Applications of Artificial Intelligence (Registration extended until 16.02.2026)			Käfer
ST 2026	791-AIFB-AIAKI-HK	Applied Informatics - Applications of AI (Registration until 20.07.2026)			Käfer

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Assessment
Written Examination (60 min) according to §4, Abs. 2, 1 of the examination regulations or oral examination of 20 minutes according to §4, Abs. 2, 2 of the examination regulations. The exam takes place every semester and can be repeated at every regular examination date.

Prerequisites
None.

Recommendations
Basics in logic, e.g. from lecture Foundations of Informatics 1 are important.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Applied Informatics - Applications of Artificial Intelligence

2511314, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Content
The lecture provides insights into the fundamentals of artificial intelligence. Basic methods of artificial intelligence and their applications in industry are presented.

Applications of the AI is a sub-area of computer science dealing with the automation of intelligent behavior. In general, it is a question of mapping human intelligence. Methods of artificial intelligence are presented in various areas such as, for example, question answering systems, speech recognition and image recognition.

The lecture gives an introduction to the basic concepts of artificial intelligence. Essential theoretical foundations, methods and their applications are presented and explained.

This lecture aims to provide students with a basic knowledge and understanding of the structure, analysis and application of selected methods and technologies on artificial intelligence. The topics include, among others, knowledge modeling, machine learning, text mining, uninformed search, and intelligent agents.

Learning objectives:

The students

- consider current research topics in the field of artificial intelligence and in particular learn about the topics of knowledge modeling, machine learning, text mining and uninformed search.
- interdisciplinary thinking.
- technological approaches to current problems.

Workload:

- The total workload for this course is approximately 135 hours
- Time of presentness: 45 hours
- Time of preperation and postprocessing: 60 hours
- Exam and exam preperation: 30 hours

V **Exercises to Applied Informatics - Applications of Artificial Intelligence**
2511315, WS 25/26, 1 SWS, Language: German, Open in study portal

Practice (Ü)
On-Site

Content
The exercises are oriented on the lecture applications of AI.

Multiple exercises are held that capture the topics, held in the lecture Applications of AI and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

This lecture aims to provide students with a basic knowledge and understanding of the structure, analysis and application of selected methods and technologies on artificial intelligence. The topics include, among others, knowledge modeling, machine learning, text mining, uninformed search, and intelligent agents.

Learning objectives:

The students

- consider current research topics in the field of artificial intelligence and in particular learn about the topics of knowledge modeling, machine learning, text mining and uninformed search.
- interdisciplinary thinking.
- technological approaches to current problems.

T 7.18 Module component: Applied Informatics – Cybersecurity [T-WIWI-114156]

Coordinators: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101426 - Electives in Informatics
M-WIWI-105112 - Applied Informatics

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	2

Courses					
ST 2026	2511550	Applied Informatics – Cybersecurity	2 SWS	Lecture / 🗣	Volkamer
ST 2026	2511551	Exercise Applied Informatics – Cybersecurity	1 SWS	Practice / 🗣	Volkamer, Berens, Ballreich
Exams					
WT 25/26	79AIFB_CS_A2	Applied Informatics – Cybersecurity (Registration extended until 16.02.2026)			Volkamer
ST 2026	79AIFB_CS_A1	Applied Informatics – Cybersecurity (Registration until 14.09.2026)			Volkamer

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, × Cancelled

Assessment
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (30 min) following §4, Abs. 2, 2 of the examination regulation, for which admission must be obtained through successful participation in the exercise during the semester.

The exam takes place every semester and can be repeated at every regular examination date.

Modeled Prerequisites
The following conditions have to be fulfilled:

1. The module component T-WIWI-108387 - Information Security must not have been started.

Additional Information
Competence Goal

The student

- can explain and apply the basics of information security
- knows appropriate measures to achieve different protection goals and can implement these measures
- can assess the quality of organizational protective measures, i.e. among other things
- knows what has to be taken intoaccount when using the individual measures
- understands the differences between information security in the enterprise and in the private context
- knows the areas of application of a variety of relevant standards and knows their weaknesses
- knows and can explain the problems of information security which may arise from human-machine interaction
- can assess messages about detected security problems in a critical way
- can structure a software project in the field of information security and explain and present results in oral and written form
- can use the techniques of Human Centred Security and Privacy by Design to create user-friendly software.

Content

- Basics and concepts of information security
- Understanding the protection objectives of information security and various attack models (including associated assumptions)
- introduction of measures to achieve the respective protection goals, taking into account different attack models
- Note: In contrast to the IT Security lecture, measures such as encryption algorithms are treated only abstractly, i.e. the idea of the measure, assumptions to the attacker and the deployment environment.
- Presentation and analysis of problems of information security arising from human-machine interaction and presentation of the Human Centered Security by Design approach.
- Introduction into organizational protective measures and standards to be observed for companies.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V	**Applied Informatics – Cybersecurity** 2511550, SS 2026, 2 SWS, Language: German, Open in study portal	**Lecture (V)** **On-Site**

Content

- Basics and concepts of information security
- Understanding the protection objectives of information security and various attack models (including associated assumptions)
- introduction of measures to achieve the respective protection goals, taking into account different attack models
- Note: In contrast to the IT Security lecture, measures such as encryption algorithms are treated only abstractly, i. e. the idea of the measure, assumptions to the attacker and the deployment environment.
- Presentation and analysis of problems of information security arising from human-machine interaction and presentation of the Human Centered Security by Design approach.
- Introduction into organisational protective measures and standards to be observed for companies

Learing objectives:

The student

- can explain the basics of information security
- knows suitable measures to achieve different protection goals
- can assess the quality of organisational protective measures, i. e. among other things knows what has to be taken into account when using the individual measures
- understands the differences between information security in the organisational and in the private context
- knows the areas of application of different standards and knows their weaknesses
- knows and can explain the problems of information security that which arise from human-machine interaction
- is able to deal with messages concerning found security problems in a critical way.

This course can also be credited for the KASTEL certificate. Further information about obtaining the certificate can be found on the SECUSO website https://secuso.aifb.kit.edu/Studium_und_Lehre.php).

Literature

- P. Gerber, M. Ghiglieri, B. Henhapl, O. Kulyk, K. Marky, P. Mayer, B. Reinheimer, and M. Volkamer, *Human Factors in Security*. Springer, Jan. 2018, pp. 83–98.
- C. Eckert, *IT-Sicherheit: Konzepte-Verfahren-Protokolle*. Walter de Gruyter, 2013

V	**Exercise Applied Informatics – Cybersecurity** 2511551, SS 2026, 1 SWS, Language: German, Open in study portal	**Practice (Ü)** **On-Site**

Content

This course can also be credited for the KASTEL certificate. Further information about obtaining the certificate can be found on the SECUSO website https://secuso.aifb.kit.edu/Studium_und_Lehre.php).

T 7.19 Module component: Applied Informatics – Database Systems [T-WIWI-110341]

Coordinators: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101426 - Electives in Informatics
M-WIWI-105112 - Applied Informatics

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	2

Courses					
ST 2026	2511200	Applied Informatics - Database Systems	2 SWS	Lecture / 🗣	Sommer
ST 2026	2511201	Exercises Applied Informatics - Database Systems	1 SWS	Practice / 🗣	Sommer
Exams					
WT 25/26	79AIFB_DBS_C5	Applied Informatics – Database Systems (Registration extended until 16.02.2026)			Oberweis
ST 2026	791-AIFB-DBS-HK	Applied Informatics - Database Systems (Registration until 20.07.2026)			Oberweis

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (60 minutes) in the first week after lecture period.

Modeled Prerequisites
The following conditions have to be fulfilled:

1. The module component T-WIWI-102660 - Database Systems must not have been started.

Additional Information
Replaces from summer semester 2020 T-WIWI-102660 "Database Systems".

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V **Applied Informatics - Database Systems** — Lecture (V) On-Site
2511200, SS 2026, 2 SWS, Language: German, Open in study portal

Content
As the foundation of business information systems, database systems (DBS) play a central role in companies. Internal and external data are stored and processed in the company's databases. Proper management and organization of this data helps resolve numerous issues, enables simultaneous queries by multiple users, and serves as the organizational and operational foundation for all of the company's workflows and processes. The course introduces students to the field of database theory, covers the fundamentals of database languages and database systems, examines basic concepts of object-oriented and XML databases, and teaches the principles of multi-user database control and physical data organization. In addition, it provides an overview of database problems frequently encountered in business practice, such as those related to data correctness (operational and semantic integrity), restoring a consistent database state, and synchronizing parallel transactions.

Learning objectives:

Students

- explain the concepts and principles of database models, languages, and systems, as well as their potential applications,
- design relational databases based on a solid theoretical foundation,
- create queries for relational database systems,
- gain an overview of advanced database issues in business practice.

Workload:

- Attendance time – Lecture (2 SWS × 15 weeks): 30 h
- Attendance time – Tutorial (1 SWS × 15 weeks): 15 h
- Self-study – Lecture: 45 h
- Self-study – Tutorial: 25 h
- Exam preparation: 20 h
- Total workload: 135 h

Literature

- Gunter Schlageter, Wolffried Stucky: Datenbanksysteme: Konzepte und Modelle. 2., neubearb. u. erw. Aufl. Teubner, Stuttgart 1983.
- Alfons Kemper, André Eickler: Datenbanksysteme: Eine Einführung. 10., erw. und aktual. Aufl. De Gruyter Oldenbourg, Berlin, 2015.
- Ramez Elmasri, Sham Navathe: Fundamentals of Database Systems. 7. ed. Pearson, Harlow, 2016.
- Gunter Saake, Kai-Uwe Sattler, Andreas Heuer: Datenbanken. Konzepte und Sprachen. 6. Aufl. mitp, Heidelberg u. a., 2018.
- Weitere Literatur wird in der Vorlesung bekannt gegeben. / Additional reading material will be announced during the lecture.

V **Exercises Applied Informatics - Database Systems**
2511201, SS 2026, 1 SWS, Language: German, Open in study portal

Practice (Ü)
On-Site

Content
As the foundation of business information systems, database systems (DBS) play a central role in companies. Internal and external data are stored and processed in the company's databases. Proper management and organization of this data helps resolve numerous issues, enables simultaneous queries by multiple users, and serves as the organizational and operational foundation for all of the company's workflows and processes. The course introduces students to the field of database theory, covers the fundamentals of database languages and database systems, examines basic concepts of object-oriented and XML databases, and teaches the principles of multi-user database control and physical data organization. In addition, it provides an overview of database problems frequently encountered in business practice, such as those related to data correctness (operational and semantic integrity), restoring a consistent database state, and synchronizing parallel transactions.

Learning objectives:

Students

- explain the concepts and principles of database models, languages, and systems, as well as their potential applications,
- design relational databases based on a solid theoretical foundation,
- create queries for relational database systems,
- gain an overview of advanced database issues in business practice.

Workload:

- Attendance time – Lecture (2 SWS × 15 weeks): 30 h
- Attendance time – Tutorial (1 SWS × 15 weeks): 15 h
- Self-study – Lecture: 45 h
- Self-study – Tutorial: 25 h
- Exam preparation: 20 h
- Total workload: 135 h

Literature

- Gunter Schlageter, Wolffried Stucky: Datenbanksysteme: Konzepte und Modelle. 2., neubearb. u. erw. Aufl. Teubner, Stuttgart 1983.
- Alfons Kemper, André Eickler: Datenbanksysteme: Eine Einführung. 10., erw. und aktual. Aufl. De Gruyter Oldenbourg, Berlin, 2015.
- Ramez Elmasri, Sham Navathe: Fundamentals of Database Systems. 7. ed. Pearson, Harlow, 2016.
- Gunter Saake, Kai-Uwe Sattler, Andreas Heuer: Datenbanken. Konzepte und Sprachen. 6. Aufl. mitp, Heidelberg u. a., 2018.
- Weitere Literatur wird in der Vorlesung bekannt gegeben. / Additional reading material will be announced during the lecture.

T 7.20 Module component: Applied Informatics – Mobile Computing [T-WIWI-113957]

Coordinators: Dr.-Ing. Gunther Schiefer
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101426 - Electives in Informatics
M-WIWI-105112 - Applied Informatics

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	1

Courses					
ST 2026	2511226	Applied Informatics - Mobile Computing	2 SWS	Lecture / 🗣	Schiefer
ST 2026	2511227	Exercises Applied Informatics - Mobile Computing	1 SWS	Practice / 🗣	Schiefer
Exams					
ST 2026	791-AIFB-AIMC-HK	Applied Informatics – Mobile Computing (Registration until 20.07.2026)			Schiefer

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Success is assessed in the form of a written (60 min) or oral examination.

Prerequisites
None

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Applied Informatics - Mobile Computing
2511226, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The lecture covers the basics of mobile computing. These are interlinked with the economic background in Germany.

Contents are:

1. organizational matters
2. introduction & definitions
3. mobile devices
4. mobile radio technologies
5. mobile communications market
6. mobile applications
7. digital radio technologies
8. location & context

Note: The teaching units listed above each have a different scope.

Learning objectives:

If you are confronted with a question in your job which affects "Mobile Computing", you should be able to provide answers quickly and competently:

Market structures
technique
Possibilities for applications
lawsuits
issues

Workload:

The total workload for this course unit is approx. 135 hours (4.5 credit points).

Organizational issues
Vorlesung und Übung werden integriert angeboten.

Literature

- Jochen Schiller: Mobilkommunikation (2. Aufl. 2003)
  http://www.mi.fu-berlin.de/inf/groups/ag-tech/teaching/resources/ Mobile_Communications/course_Material/index.html
- Martin Sauter: Grundkurs Mobile Kommunikationssysteme (6. Aufl. 2015)
  http://link.springer.com/book/10.1007%2F978-3-658-08342-7
- Küpper, A.: Location-based Services. Fundamentals and Operation. Wiley & Sons, 2005.
- Roth, J.: Mobile Computing. Grundlagen, Technik, Konzepte. Dpunkt.verlag, 2. Auflage, 2005.
- Mansfeld, W.: Satellitenortung und Navigation:
  Grundlagen, Wirkungsweise und Anwendung globaler Satellitennavigationssysteme
- Dodel, H., Häupler, D.: Satellitennavigation

Einige relevante Informationen im Web

- Bundesnetzagentur http://www.bundesnetzagentur.de
  u.a. Jahresbericht und Marktbeobachtung
- VATM-Marktstudien
  http://www.vatm.de/vatm-marktstudien.html
- Verbände, bspw. BITKOM (bitkom.org), eco e.V. (eco.de)
- Presse, bspw. Teltarif, Heise, Golem, …
- Statistiken (Statista Lizenz des KIT)

T 7.21 Module component: Applied Informatics – Modelling [T-WIWI-110338]

Coordinators: Andreas Fritsch
Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101426 - Electives in Informatics
M-WIWI-105112 - Applied Informatics

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	2

Courses					
WT 25/26	2511030	Applied Informatics - Modelling	2 SWS	Lecture / 🗣	Fritsch
WT 25/26	2511031	Exercises to Applied Informatics - Modelling	1 SWS	Practice / 🗣	Rybinski, Thompson
Exams					
WT 25/26	79AIFB_AI1_C4	Applied Informatics – Modelling			Oberweis, Fritsch
ST 2026	791-AIFB-AIM-NK	Applied Informatics - Modelling (Registration extended until 20 July 2026)			Oberweis, Fritsch

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written examination (60 min) in the first week after lecture period (according to Section 4 (2),1 of the examination regulation).

Prerequisites
None

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Applied Informatics - Modelling

Lecture (V)
On-Site

2511030, WS 25/26, 2 SWS, Language: German, Open in study portal

Content
In the context of complex information systems, modelling is of central importance, e.g. – in the context of systems to be developed – for a better understanding of their functionality or in the context of existing systems for supporting maintenance and further development.

Modelling, in particular modelling of information systems, forms the core part of this lecture. The lecture is organized in two parts. The first part mainly covers the modelling of static aspectes, the second part covers the modelling of dynamic aspects of information systems.

The lecture sets out with a definition of modelling and the advantages of modelling. After that, advanced aspects of UML, the Entity Relationship model (ER model) and logics as a means of modelling static aspects will be explained. This will be complemented by the relational data model and the systematic design of databases based on ER models. For modelling dynamic aspects, different types of petri-nets together with their respective analysis techniques will be introduced.

Learning objectives:

Students

- explain the strengths and weaknesses of various modeling approachesfor Information Systems and choose an appropriate method for a given problem,
- create UML models, ER models and Petri nets for given problems,
- modelling given situations in propositional and predicate logic and can interpret them,
- analyze various properties in propositional and predicate logic,
- create and evaluate a relational database schema and express queries in relational algebra.

Workload:

- Total effort: 120-135 hours
- Presence time: 45 hours
- Self study: 75-90 hours

Literature

- Bernhard Rumpe. Modellierung mit UML, Springer-Verlag, 2004.
- R. Elmasri, S. B. Navathe. Fundamentals of Database Systems. Pearson Education 2009.
- W. Reisig. Petrinetze, Springer-Verlag, 2010.

Weiterführende Literatur:

- U. Kastens, H. Kleine Büning. Modellierung – Grundlagen und Formale Methoden. Carl Hanser Verlag, 2014
- J.L. Peterson. Petri Net Theory and Modeling of Systems, Prentice Hall, 1981.
- U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag,
2000

V **Exercises to Applied Informatics - Modelling** — **Practice (Ü) On-Site**
2511031, WS 25/26, 1 SWS, Language: German, Open in study portal

Content

In the context of complex information systems, modelling is of central importance, e.g. – in the context of systems to be developed – for a better understanding of their functionality or in the context of existing systems for supporting maintenance and further development.

Modelling, in particular modelling of information systems, forms the core part of this lecture. The lecture is organized in two parts. The first part mainly covers the modelling of static aspectes, the second part covers the modelling of dynamic aspects of information systems.

The lecture sets out with a definition of modelling and the advantages of modelling. After that, advanced aspects of UML, the Entity Relationship model (ER model) and logics as a means of modelling static aspects will be explained. This will be complemented by the relational data model and the systematic design of databases based on ER models. For modelling dynamic aspects, different types of petri-nets together with their respective analysis techniques will be introduced.

Learning objectives:

Students

- explain the strengths and weaknesses of various modeling approachesfor Information Systems and choose an appropriate method for a given problem,
- create UML models, ER models and Petri nets for given problems,
- modelling given situations in propositional and predicate logic and can interpret them,
- analyze various properties in propositional and predicate logic,
- create and evaluate a relational database schema and express queries in relational algebra.

Workload:

- Total effort: 120-135 hours
- Presence time: 45 hours
- Self study: 75-90 hours

Literature

-
    - Bernhard Rumpe. Modellierung mit UML, Springer-Verlag, 2004.
    - R. Elmasri, S. B. Navathe. Fundamentals of Database Systems. Pearson Education 2009.
    - W. Reisig. Petrinetze, Springer-Verlag, 2010.

  Weiterführende Literatur:

    - U. Kastens, H. Kleine Büning. Modellierung – Grundlagen und Formale Methoden. Carl Hanser Verlag, 2014
    - J.L. Peterson. Petri Net Theory and Modeling of Systems, Prentice Hall, 1981.
    - U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag,
      2000

T 7.22 Module component: Artificial Intelligence in Production [T-MACH-112115]

Coordinators: Prof. Dr.-Ing. Jürgen Fleischer
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each winter term	1

Courses					
WT 25/26	2149921	Artificial Intelligence in Production	3 SWS	Lecture / 🗣	Fleischer
Exams					
WT 25/26	76-T-MACH-112970	Artificial Intelligence in Production			Fleischer

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written Exam (90 min)

Prerequisites
none

Additional Information
The course is offered in German.

Workload
150 hours

Below you will find excerpts from courses related to this module component:

V Artificial Intelligence in Production

2149921, WS 25/26, 3 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

The module AI in Production is designed to teach students the practical, holistic integration of machine learning and artificial intelligence methods in production. The course is oriented towards the phases of the CRISP-DM process with the aim of developing a deep understanding of the necessary steps and content-related aspects (methods) within the individual phases. In addition to teaching the practical aspects of integrating the most important machine learning methods, the focus is primarily on the necessary steps for data generation and data preparation as well as the implementation and validation of the methods in an industrial environment.

The lecture"Artificial Intelligence in Production" deals with the theoretical basics in a practical context. Here, the six phases of the CRISP-DM process are run through sequentially and the necessary basics for the implementation of the respective phases are taught. The course first deals with the data sources that are prevalent in the production environment. Subsequently, possibilities for target-oriented data acquisition as well as data transfer and data storage are introduced. Possibilities for data filtering and data preprocessing are discussed and production-relevant aspects are pointed out. The course then covers in detail the necessary algorithms and procedures for implementing AI in production, before techniques and fundamentals for making the models permanent in production (deployment) are discussed.

Learning Outcomes:

The students

- understand the relevance for the application of AI in production and know the main drivers and challenges.
- will understand the CRISP-DM process for implementing AI projects in manufacturing. Students will be able to name the main data sources, data ingestion methods, communication architectures, models and methods for data processing.
- will understand the main machine learning techniques and be able to contrast and select them in the context of industrial issues.
- are able to assess whether a specific problem in the context of production can be solved in a target-oriented manner using machine learning methods, as well as what the necessary steps are for implementation.
- are able to assess the most important challenges and name possible approaches to solve them.
- are able to apply the phases of the CRISP-DM to a problem in production. Students will know the steps necessary to build a data pipeline and will be able to do so theoretically in the context of a real-world use case.
- are able to evaluate the results of common deep learning methods and, based on this, to theoretically elaborate and theoretically apply proposed solutions (from the field of machine learning).

Workload:

MACH:
regular attendance: 31,5 hours
self-study: 88,5 hours
WING:
regular attendance: 31,5 hours
self-study: 118,5 hours

Organizational issues

Vorlesungstermine freitags 14:00 Uhr, begleitet durch Online-Programmierübungen.

Zur Vertiefung des im Rahmen der Lehrveranstaltung erworbenen Wissens werden die theoretischen Vorlesungseinheiten durch Praxiseinheiten im Umfeld der Karlsruher Forschungsfabrik (https://www.karlsruher-forschungsfabrik.de) unterstützt.

The theoretical lectures are complemented by practical lectures in the Karlsruhe Research Factory (https://www.karlsruher-forschungsfabrik.de/en.html) to deepen the acquired knowledge.

Literature

Skript zur Veranstaltung wird über Ilias (https://ilias.studium.kit.edu/) bereitgestellt.

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/).

T 7.23 Module component: Automation and Autonomy in Logistics [T-MACH-113566]

Coordinators: Dr.-Ing. Carolin Brenner
Prof. Dr.-Ing. Kai Furmans

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106995 - Automation and Material Flow in Logistics

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	4,5 CP	graded	Each winter term	1 semesters	2

Courses					
WT 25/26	2117050	Automation and Autonomy in Logistics	3 SWS	Lecture / 🗣	Brenner
Exams					
WT 25/26	76-T-MACH-113566	Automation and Autonomy in Logistics			Brenner

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written exam, duration 60 minutes

Prerequisites
none

Recommendations
none

Additional Information
The course is offered in English.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Automation and Autonomy in Logistics

2117050, WS 25/26, 3 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
The course provides application-oriented knowledge on automated- and autonomous systems in logistics. The focus is on technologies such as mobile robots, humanoid robots, AI and control systems. The lecture is supplemented by practical exercises and impulses from industry in the form of guest lectures by companies. In a creative group exercise, students develop concepts for integrating autonomous/automated systems into logistics processes and evaluate their feasibility. In addition, participants program their own applications, which are then tested on real robots. The aim is to convey a deep understanding of the possibilities and limits of modern robotics in logistics and to gain practical experience with automated systems.

T 7.24 Module component: Automotive Engineering I [T-MACH-102203]

Coordinators: Prof. Dr. Frank Gauterin
Dr.-Ing. Martin Gießler

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Automotive Engineering

Type	Credits	Grading	Term offered	Version
Written examination	9 CP	graded	Each winter term	3

Courses					
WT 25/26	2113809	Automotive Engineering I	4 SWS	Lecture / 🗣	Gießler
Exams					
WT 25/26	76-T-MACH-102203	Automotive Engineering I			Gießler
ST 2026	76-T-MACH-102203	Automotive Engineering I			Gießler

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written examination

Duration: 120 minutes

Auxiliary means: none

Modeled Prerequisites
The following conditions have to be fulfilled:

1. The module component T-MACH-100092 - Automotive Engineering I (in German) must not have been started.

Additional Information
The course is offered in English.

Below you will find excerpts from courses related to this module component:

V Automotive Engineering I

Lecture (V)
On-Site

2113809, WS 25/26, 4 SWS, Language: English, Open in study portal

Content
1. History and future of the automobile

2. Driving mechanics: driving resistances and driving performances, mechanics of longitudinal and lateral forces, active and passive safety

3. Drive systems: combustion engine, hybrid and electric drive systems

4. Transmission: clutches (e.g. friction clutch, visco clutch), transmission (e.g. mechanical transmission, hydraulic fluid transmission)

5.Power transmission and distribution: drive shafts, cardon joints, differentials

Learning Objectives:

The students know the movements and the forces at the vehicle and are familiar with active and passive safety. They have proper knowledge about operation of engines and alternative drives, the necessary transmission between engine and drive wheels and the power distribution. They have an overview of the components necessary for the drive and have the basic knowledge, to analyze, to evaluate, and to develop the complex system "vehicle".

Organizational issues

You will find the lecture material on ILIAS. To get the ILIAS password, KIT students refer to https://fast-web-01.fast.kit.edu/PasswoerterIlias/, students from eucor universities send an e-mail to martina.kaiser@kit.edu

Kann nicht mit LV Grundlagen der Fahrzeugtechnik I [2113805] kombiniert werden.

Can not be combined with lecture [2113805] Grundlagen der Fahrzeugtechnik I.

Literature

1. Robert Bosch GmbH: Automotive Handbook, 9th Edition, Wiley, Chichister 2015

2. Onori, S. / Serrao, L: / Rizzoni, G.: Hybrid Electric Vehicles - Energy Management Strategies, Springer London, Heidelberg, New York, Dordrecht 2016

3. Reif, K.: Brakes, Brake Control and Driver Assistance Systems - Function, Regulation and Components, Springer Vieweg, Wiesbaden 2015

4. Gauterin, F. / Gießler, M. / Gnadler, R.: Scriptum zur Vorlesung 'Automotive Engineering I', KIT, Institut für Fahrzeugsystemtechnik, Karlsruhe, jährlich aktualisiert

T 7.25 Module component: Automotive Engineering I (in German) [T-MACH-100092]

Coordinators: Dr.-Ing. Martin Gießler
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Automotive Engineering

Type	Credits	Grading	Term offered	Expansion	Language	Version
Written examination	6 CP	graded	Each winter term	1 semesters		4

Courses					
WT 25/26	2113805	Automotive Engineering I	4 SWS	Lecture / 🗣	Gießler
Exams					
WT 25/26	76-T-MACH-100092	Automotive Engineering			Gießler
ST 2026	76-T-MACH-100092	Automotive Engineering			Gießler

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written examination

Duration: 90 minutes

Auxiliary means: none

Prerequisites
The module component "T-MACH-102203 - Automotive Engineering I" is not started or finished. The module components "T-MACH-100092 - Grundlagen der Fahrzeugtechnik I" and "T-MACH-102203 - Automotive Engineering I" can not be combined.

Additional Information
The course is offered in German.

Workload
180 hours

Below you will find excerpts from courses related to this module component:

V Automotive Engineering I

2113805, WS 25/26, 4 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
1. History and future of the automobile

2. Driving mechanics: driving resistances and driving performance, mechanics of longitudinal and lateral forces, active and passive safety

3. Drive systems: combustion engine, hybrid and electric drive systems

4. Transmission: clutches (e.g. friction clutch, visco clutch), transmission (e.g. mechanical transmission, hydraulic fluid transmission)

5. Power transmission and distribution: drive shafts, cardon joints, differentials

Learning Objectives:

The students know the movements and the forces at the vehicle and are familiar with active and passive safety. They have proper knowledge about operation of engines and alternative drives, the necessary transmission between engine and drive wheels and the power distribution. They have an overview of the components necessary for the drive and have the basic knowledge, to analyze, to evaluate, and to develop the complex system "vehicle".

Organizational issues

Das Vorlesungsmaterial wird auf ILIAS bereitgestellt. Das ILIAS-Passwort erhalten Sie unter https://fast-web-01.fast.kit.edu/PasswoerterIlias/

Kann nicht mit der Veranstaltung [2113809] kombiniert werden.

Can not be combined with lecture [2113809].

Literature

1. Mitschke, M. / Wallentowitz, H.: Dynamik der Kraftfahrzeuge, Springer Vieweg, Wiesbaden 2014

2. Pischinger, S. / Seiffert, U.: Handbuch Kraftfahrzeugtechnik, Springer Vieweg, Wiesbaden 2016

3. Gauterin, F. / Unrau, H.-J. / Gnadler, R.: Scriptum zur Vorlesung "Grundlagen der Fahrzeugtechnik I", KIT, Institut für Fahrzeugsystemtechnik, Karlsruhe, jährlich aktualisiert

7.26 Module component: Automotive Engineering II [T-MACH-114435]

Coordinators: Dr.-Ing. Martin Gießler
Organisation: KIT Department of Mechanical Engineering

KIT Department of Business and Economics
Part of: M-MACH-101266 - Automotive Engineering

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	2

Courses					
ST 2026	2114855	Automotive Engineering II	2 SWS	Lecture / 🗣	Gießler
Exams					
ST 2026	76-T-MACH-114435	Automotive Engineering II			Gießler

Legend: 📱 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written Examination

Duration: 90 minutes

Auxiliary means: none

Prerequisites
Only one out of the two moduls "M-MACH-102117 - Grundlagen der Fahrzeugtechnik II"and "M-MACH-114435 - Automotive Engineering II" is allowed.

Additional Information
The course is offered in English.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

Automotive Engineering II

2114855, SS 2026, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content

1. Chassis: Wheel suspensions (rear axles, front axles, kinematics of axles), tyres, springs, damping devices
2. Steering elements: Manual steering, servo steering, steer by wire
3. Brakes: Disc brake, drum brake, comparison of the designs

Learning Objectives:

The students have an overview of the modules which are necessary for the tracking of a motor vehicle and the power transmission between vehicle and roadway. They have knowledge of different wheel suspensions, tyres, steering elements, and brakes. They know different design versions, functions and the influence on driving and braking behavior. They are able to correctly develop the appropriate components. They are ready to analyze, to evaluate, and to optimize the complex interaction of the different components under consideration of boundary conditions.

Literature
Elective literature:

1. Robert Bosch GmbH: Automotive Handbook, 9th Edition, Wiley, Chichester 2015
2. Heißing, B. / Ersoy, M.: Chassis Handbook - fundamentals, driving dynamics, components, mechatronics, perspectives, Vieweg+Teubner, Wiesbaden 2011
3. Gießler, M. / Gnadler, R.: Script to the lecture "Automotive Engineering II", KIT, Institut of Vehicle System Technology, Karlsruhe, annual update

T 7.27 Module component: Automotive Engineering II (in German) [T-MACH-102117]

Coordinators: Dr.-Ing. Martin Gießler
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Automotive Engineering

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	graded	Each summer term	3

Courses					
ST 2026	2114835	Automotive Engineering II	2 SWS	Lecture / 🗣	Gießler
ST 2026	2114855	Automotive Engineering II	2 SWS	Lecture / 🗣	Gießler
Exams					
WT 25/26	76-T-MACH-102117	Automotive Engineering II			Gießler
WT 25/26	76-T-MACH-102117-ENG	Automotive Engineering II			Gießler
ST 2026	76-T-MACH-102117	Automotive Engineering II			Gießler

Legend: 🖥 Online, ❁ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written Examination

Duration: 90 minutes

Auxiliary means: none

Prerequisites
Only one out of the two moduls "M-MACH-102117 - Grundlagen der Fahrzeugtechnik II"and "M-MACH-114435 - Automotive Engineering II" is allowed.

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Automotive Engineering II

2114835, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
1. Chassis: Wheel suspensions (rear axles, front axles, kinematics of axles), tyres, springs, damping devices
2. Steering elements: Manual steering, servo steering, steer by wire
3. Brakes: Disc brake, drum brake, comparison of designs

Learning Objectives:

The students have an overview of the modules which are necessary for the tracking of a motor vehicle and the power transmission between vehicle bodywork and roadway. They have knowledge of different wheel suspensions, tyres, steering elements, and brakes. They know different design versions, functions and the influence on driving and braking behavior. They are able to correctly develop the appropriate components. They are ready to analyze, to evaluate, and to optimize the complex interaction of the different components under consideration of boundary conditions.

Organizational issues
Kann nicht mit der Veranstaltung [2114855] kombiniert werden.

Can not be combined with lecture [2114855]

Literature

1. Heißing, B. / Ersoy, M.: Fahrwerkhandbuch: Grundlagen, Fahrdynamik, Komponenten, Systeme, Mechatronik, Perspektiven, Springer Vieweg, Wiesbaden, 2013

2. Breuer, B. / Bill, K.-H.: Bremsenhandbuch: Grundlagen - Komponenten - Systeme - Fahrdynamik, Springer Vieweg, Wiesbaden, 2017

3. Unrau, H.-J. / Gnadler, R.: Scriptum zur Vorlesung 'Grundlagen der Fahrzeugtechnik II', KIT, Institut für Fahrzeugsystemtechnik, Karlsruhe, jährliche Aktualisierung

V

Automotive Engineering II

2114855, SS 2026, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content

1. Chassis: Wheel suspensions (rear axles, front axles, kinematics of axles), tyres, springs, damping devices
2. Steering elements: Manual steering, servo steering, steer by wire
3. Brakes: Disc brake, drum brake, comparison of the designs

Learning Objectives:

The students have an overview of the modules which are necessary for the tracking of a motor vehicle and the power transmission between vehicle and roadway. They have knowledge of different wheel suspensions, tyres, steering elements, and brakes. They know different design versions, functions and the influence on driving and braking behavior. They are able to correctly develop the appropriate components. They are ready to analyze, to evaluate, and to optimize the complex interaction of the different components under consideration of boundary conditions.

Literature
Elective literature:

1. Robert Bosch GmbH: Automotive Handbook, 9th Edition, Wiley, Chichester 2015
2. Heißing, B. / Ersoy, M.: Chassis Handbook - fundamentals, driving dynamics, components, mechatronics, perspectives, Vieweg+Teubner, Wiesbaden 2011
3. Gießler, M. / Gnadler, R.: Script to the lecture "Automotive Engineering II", KIT, Institut of Vehicle System Technology, Karlsruhe, annual update

T 7.28 Module component: B2B Sales Management [T-WIWI-111367]

Coordinators: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101424 - Foundations of Marketing

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2572187	B2B Sales Management	2 SWS	Lecture / 🗣	Klarmann
WT 25/26	2572188	Excercises B2B Sales Management	1 SWS	Practice / 🗣	Daumann, Weber
Exams					
WT 25/26	7900125	B2B Sales Management			Klarmann
ST 2026	7900021	B2B Sales Management			Klarmann

Legend: 🖥 Online, ⯐ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment of success takes place through the preparation and presentation of a sales presentation based on a case study (max 30 points) and a written exam with additional aids in the sense of an open book exam (max. 60 points). In total, a maximum of 90 points can be achieved in the course. Further details will be announced during the lecture.

Prerequisites
None.

Additional Information
For further information, please contact Marketing and Sales Research Group (marketing.iism.kit.edu).

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V B2B Sales Management

2572187, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

Content

The event is designed to teach you taking on marketing responsibility in a very special business environment. This involves companies that sell and market their (often technically highly complex) products themselves to other companies, which is referred to as "business-to-business" (B2B) marketing and sales. Since traditional communication instruments (e.g. advertising) often hardly work in this environment and many projects lead to a long-term cooperation between supplier and customer, (personal) sales play a special role in marketing. Therefore, this event introduces marketing in B2B markets on the one hand and deals with questions of sales and distribution on the other hand.

Topics with regard to B2B sales management are:

- Basic aspects of B2B sales and B2B purchasing
- Understanding of marketing challenges in specific B2B business types (commodities, systems, solutions)
- Value pricing and value-based selling
- Organizational buying behavior
- Basics of B2B customer relationship management (e.g. key account management, reference customer management)
- Sales process (lead generation, sales presentations, customer-oriented selling, closing)
- Sales automation

Learning objectives

Students

- Are familiar with marketing and sales peculiarities and challenges in B2B environments
- Are able to identify different B2B business types and their marketing characteristics
- Are familiar with central theories of organizational buying behavior
- Are familiar with central objectives of Customer Relationship Management in B2B environments and are able to implement them with appropriate tools
- Are able to prioritize customers and calculate B2B Customer Lifetime Value
- Know how B2B sales presentations work and have also gained practical experience in this area
- Are able to determine value-based prices

Workload

The total workload for this course is approximately 135.0 hours.
Attendance time: 35.0 hours
Self-study: 100.0 hours

Organization

A detailed schedule will be announced.

Literature

Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.

T 7.29 Module component: Bachelor's Thesis [T-WIWI-103067]

Coordinators: Studiendekan des KIT-Studienganges
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101601 - Bachelor's Thesis

Type	Credits	Grading	Version
Final Thesis	12 CP	graded	1

Assessment
see module description

Prerequisites
see module description

Final Thesis
This module component represents a final thesis. The following periods have been supplied:

Submission deadline	6 months
Maximum extension period	1 months
Correction period	6 weeks

T 7.30 Module component: Basic Principles of Economic Policy [T-WIWI-103213]

Coordinators: Prof. Dr. Ingrid Ott
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101668 - Economic Policy I

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	see Annotations	1

Courses					
ST 2026	2560280	Basic Principles of Economic Policy	2 SWS	Lecture / 🗣	Ott
ST 2026	2560281	Exercises of Basic Principles of Economic Policy	1 SWS	Practice / 🗣	Ghoniem
Exams					
WT 25/26	7900079	Basic Principles of Economic Policy			Ott
ST 2026	7900106	Basic Principles of Economic Policy			Ott

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Success is assessed in the form of a written examination (60 minutes). The examination is offered every semester and can be repeated at any regular examination date.

Prerequisites
None

Recommendations
Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2610012], and Economics II [2600014].

Additional Information
Please note that the lecture will not be held in summer semester 2026. The exam is offered.

Description:

Theory of general economic policy and discussion of current economic policy topics:

- Goals of economic policy,
- Instruments and institutions of economic policy,
- Triad of regional, national and European economic policies,
- special fields of economic policy, in particular growth, employment, provision of public infrastructure and climate policy.

Learning objectives:

Students learn:

- To apply basic concepts of micro- and macroeconomic theories to economic policy issues.
- to develop arguments on how state intervention in the market can be legitimized from a welfare economic perspective
- to derive theory-based policy recommendations.

Learning content:

- Market interventions: microeconomic perspective
- Market interventions: macroeconomic perspective
- Institutional economic aspects
- Economic policy and welfare economics
- Economic policy makers: Political-economic aspects

Workload:

- Total effort at 4.5 LP: approx. 135 hours
- Presence time: approx. 30 hours
- Self-study: approx. 105 hours

Media:

See course announcement

References:

See course announcement

Below you will find excerpts from courses related to this module component:

V	**Basic Principles of Economic Policy** 2560280, SS 2026, 2 SWS, Language: German, Open in study portal	**Lecture (V)** **On-Site**

Content
The lecture deals with theories of general economic policy and discussion of current economic policy topics:

- Goals of economic policy,
- Instruments and institutions of economic policy,
- Triad of regional, national and European economic policies,
- special fields of economic policy, in particular growth, employment, provision of public infrastructure and climate policy.

Learning objectives:

Students shall be given the ability to

- apply basic concepts of micro- and macroeconomic theories to economic policy issues
- develop arguments on how state intervention in the market can be legitimized from a welfare economic perspective
- derive theory-based policy recommendations

Recommendations:

Basic micro- and macroeconomic knowledge is required, especially as taught in the courses Economics I [2610012] and Economics II [2600014].

Workload:

Total effort at 4.5 LP is approx. 135 hours and consists of:

- Presence time: approx. 30 hours
- Self-study: approx. 105 hours

Assessment:

The examination takes place in the form of a written examination (60min) (according to §4(2), 1 SPO). The examination is offered every semester and can be repeated at any regular examination date.

Organizational issues
Zugehörige Veranstaltung: Übungen zur Einführung in die Wirtschaftspolitik [2560281]
Vorbereitungsmaterialien finden Sie im Ilias.

Literature

- Klump, Rainer (2013): Wirtschaftspolitik. Pearson Studium
- Baldwin, Richard und Charles Wyplosz (2019): The Economics of European Integration, 6. Edition, McGraw-Hill Education, London
- Foliensatz zur Vorlesung
- Übungsaufgaben

V **Exercises of Basic Principles of Economic Policy**
2560281, SS 2026, 1 SWS, Language: German, Open in study portal

Practice (Ü)
On-Site

Organizational issues
Zugehörige Veranstaltung: [2560280] Einführung in die Wirtschaftspolitik

Literature

- Klump, Rainer (2013): Wirtschaftspolitik. Pearson Studium
- Baldwin, Richard und Charles Wyplosz (2019): The Economics of European Integration, 6. Edition, McGraw-Hill Education, London
- Foliensatz zur Vorlesung
- Übungsaufgaben

T 7.31 Module component: Basics of German Company Tax Law and Tax Planning [T-WIWI-108711]

Coordinators: Prof. Dr. Gerd Gutekunst
Prof. Dr. Berthold Wigger

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-101403 - Public Finance
M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	2

Courses					
WT 25/26	2560134	Basics of German Company Tax Law and Tax Planning	3 SWS	Lecture / 🗣	Wigger, Gutekunst
Exams					
WT 25/26	790unbe	Basics of German Company Tax Law and Tax Planning			Wigger
ST 2026	790unbe	Basics of German Company Tax Law and Tax Planning			Wigger

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Success is assessed in the form of a written examination (90 minutes). The examination is offered every semester and can be repeated at any regular examination date.

Prerequisites
None

Recommendations
Knowledge of the collection of public revenues is assumed. Therefore it is recommended to attend the course “Öffentliche Einnahmen” beforehand.

Below you will find excerpts from courses related to this module component:

V Basics of German Company Tax Law and Tax Planning

2560134, WS 25/26, 3 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
Workload:

The total workload for this course is approximately 135.0 hours. For further information see German version.

T 7.32 Module component: Basics of Technical Logistics [T-MACH-113013]

Coordinators: Dr.-Ing. Martin Mittwollen
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106995 - Automation and Material Flow in Logistics

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each winter term	3

Courses					
WT 25/26	2117057	Fundamentals of technical logistics	3 SWS	Lecture / Practice / Blended	Mittwollen
Exams					
WT 25/26	76-T-MACH-113013	Basics of Technical Logistics			Mittwollen

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
The success control takes place in the form of an examination performance of a different kind. This is composed as follows:

50% assessment of a project report in the form of a presentation with commentary

50% assessment of the presentation followed by a colloquium

To pass the exam, both components must be passed.

Prerequisites
none

Recommendations
Knowledge of the basics of technical mechanics preconditioned.

Additional Information
The course is offered in German

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Fundamentals of technical logistics
2117057, WS 25/26, 3 SWS, Language: German, Open in study portal

Lecture / Practice (VÜ)
Blended (On-Site/Online)

Content

Course content:

- Conveyed goods/conveying equipment (overview, properties, classification)
- Technical logistics processes and machines
- Energy transmission and conversion from the energy source to the load
- Electrical and mechanical transmission elements
- Hoisting gear, chassis
- Drives in conveyor technology
- Identification
- Operating behavior

Learning objectives:

After successfully completing the course, you will be able to work independently and in a team to:

- Describe technical logistics processes and machines.
- Describe the basic structure and mode of operation of conveyor technology machines using models.
- Apply the basic knowledge you have learned to real systems and machines or plan them.

Description:

The course concept combines **self-directed learning with practical application**. Students first work through the theoretical content independently using digital learning materials such as videos and scripts (**Studybytes on ILIAS**) and then use the face-to-face time (**on-campus sessions**) to apply what they have learned in interactive project work and discussions. This concept promotes **flexible, independent learning**, supports active engagement with the content, and enables targeted **practical application of knowledge**.

Off-campus:

- Self-study using Studybytes on ILIAS: videos with teaching content, scripts, bullet points, self-check questions, exercise sheets, further reading

On-campus:

- Face-to-face sessions with practical application of what has been learned

Organizational issues

Konzept: Kombination aus selbstgesteuertem Lernen mit praktischer Anwendung - siehe Beschreibung

On-Campus-Termine (geplant, Abweichungen werden im ILIAS-Kurs bekanntgegeben):

Ort: IFL Selmayr Saal (Geb. 50.38, Raum 0.23), jeweils von 14.00 - 17.15 Uhr

- 31.10.2025 oder 05.11.2025 (siehe Ilias)
- 04.11.2025
- 18.11.2025
- 02.12.2025
- 16.12.2025

Erfolgskontrolle: Prüfungsleistung anderer Art: Bearbeitung eines Projektes in 2er/3er Gruppen, Ausarbeitung einer kommentierten Präsentation, Vorstellung der Präsentation mit anschließendem Kolloquium; Individualnoten durch Kenntlichmachung des jeweiligen Arbeitsanteils

T 7.33 Module component: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II [T-MACH-100967]

Coordinators: Prof. Dr. Andreas Guber
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101287 - Microsystem Technology

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each summer term	3

Courses					
ST 2026	2142883	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II	2 SWS	Lecture / 🗣	Guber, Ahrens
Exams					
WT 25/26	76-T-MACH-100967	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II			Guber
ST 2026	76-T-MACH-100967	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II			Guber

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written exam (75 Min.)

Prerequisites
none

Additional Information
The course is offered in German

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II

2142883, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
Examples of use in Life-Sciences and biomedicine: Microfluidic Systems:
LabCD, Protein Cristallisation
Microarrys
Tissue Engineering
Cell Chip Systems
Drug Delivery Systems
Micro reaction technology
Microfluidic Cells for FTIR-Spectroscopy
Microsystem Technology for Anesthesia, Intensive Care and Infusion
Analysis Systems of Person´s Breath
Neurobionics and Neuroprosthesis
Nano Surgery

Organizational issues
Zu jedem Vorlesungstermin werden via ILIAS die jeweiligen Folien im PDF-Format zur Verfügung gestellt.

schriftl. Prüfung: Mo, 07.09.2026, 8 - 10 Uhr; 10.21 Gottlieb-Daimler-Hörsaal

Literature

Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005

Buess, G.: Operationslehre in der endoskopischen Chirurgie, Band I und II;
Springer-Verlag, 1994

M. Madou
Fundamentals of Microfabrication

T 7.34 Module component: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III [T-MACH-100968]

Coordinators: Prof. Dr. Andreas Guber
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101287 - Microsystem Technology

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each summer term	3

Courses					
ST 2026	2142879	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III	2 SWS	Lecture / 🗣	Guber, Ahrens
Exams					
WT 25/26	76-T-MACH-100968	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III			Guber
ST 2026	76-T-MACH-100968	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III			Guber

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written exam (75 Min.)

Prerequisites
none

Additional Information
The course is offered in German

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III

2142879, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
Examples of use in minimally invasive therapy
Minimally invasive surgery (MIS)
Endoscopic neurosurgery
Interventional cardiology
NOTES
OP-robots and Endosystems
License of Medical Products and Quality Management

Organizational issues
Zu jedem Vorlesungstermin werden via ILIAS die jeweiligen Folien im PDF-Format zur Verfügung gestellt.

schriftl. Prüfung: Mo, 28.09.2026, 8:00 - 10:00 Uhr; 10.21 Gottlieb-Daimler.Hörsaal

Literature
Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005

Buess, G.: Operationslehre in der endoskopischen Chirurgie, Band I und II;
Springer-Verlag, 1994

M. Madou
Fundamentals of Microfabrication

T 7.35 Module component: Boosting of Combustion Engines [T-MACH-105649]

Coordinators: Dr.-Ing. Johannes Kech
Dr. Nicolas Lachenmaier

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101303 - Combustion Engines II

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each summer term	1

Courses					
ST 2026	2134153	Boosting of Combustion Engines	2 SWS	/ 🗣	Kech
Exams					
ST 2026	76-T-MACH-105649	Boosting of Combustion Engines			Kech, Lachenmaier

Legend: 🖥 Online, ✲ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral exam, 20 min

Prerequisites
none

Additional Information
This course is offerd in German.

Workload
120 hours

T 7.36 Module component: Brand Management [T-WIWI-112156]

Coordinators: Prof. Dr. Ann-Kristin Kupfer
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101424 - Foundations of Marketing

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2572190	Brand Management	2 SWS	Lecture / 🗣	Kupfer
WT 25/26	2572191	Brand Management Exercise	1 SWS	Practice / 🗣	Cinar
Exams					
WT 25/26	7900158	Brand Management			Kupfer
ST 2026	7900047	Brand Management			Kupfer

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment of success will be done by the preparation and presentation of a case study as well as a written exam. Further details will be announced during the lecture.

Prerequisites
None

Recommendations
Students are highly encouraged to actively participate in class.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Brand Management
2572190, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
Students learn the theoretical foundations of brand management and its most important concepts. They learn both about the importance of brands for consumers as well as the importance of brands for firms. Special emphasis will be given to the development of brand strategies. Furthermore, students will learn how to evaluate and apply brand instruments. A tutorial offers the opportunity to apply the key learnings of the lecture using case studies.

The learning objectives are as follows:

- Getting to know the theoretical foundations of brand management
- Evaluating strategic branding options (e.g., relating to the development of the core of the brand and the brand architecture) and operative brand instruments (e.g., relating to the brand name and logo)
- Fostering critical and analytical thinking skills and the application of knowledge to marketing problems
- Improving English skills

Total time required for 4.5 credit points: approx. 135 hours

Attendance time: 30 hours

Self-study: 105 hours

T 7.37 Module component: CAD Workshop [T-MACH-114767]

Coordinators: Prof. Dr.-Ing. Arne Rönnau
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-107658 - Data Driven Engineering Fundamentals

Type	Credits	Grading	Term offered	Expansion	Version
Examination of another type	4 CP	graded	Each term	1 semesters	2

Courses					
WT 25/26	2121330	CAD Workshop	4 SWS	Project / 🗣	Rönnau
ST 2026	2121330	CAD Workshop	4 SWS	Project / 🗣	Rönnau
Exams					
WT 25/26	76-T-MACH-114767	CAD Workshop			Rönnau

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Learning control is an examination of another type. The overall impression is evaluated. The following aspects are included in the grading:

- Completion of the project task and documentation
- 4 interim presentations
- Final presentation including live demonstration

The grading scale will be announced in the course.

Prerequisites
The Brick T-MACH-102153 - PLM-CAD Workshop must not have been started.

Additional Information
Attendance is compulsory. The number of participants is limited. Information on the application process is available in ILIAS.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V CAD Workshop

2121330, SS 2026, 4 SWS, Language: English, Open in study portal

Project (PRO)
On-Site

Content

The CAD Workshop is a project-based bachelor-level module that provides students with a hands-on introduction to the computer-aided development of a mechatronic prototype. The course has a particular focus on the development process from the initial idea to a functional prototype, including. team organisation, product management, and marketing.

Students work in small teams and operate under limited resources (time, budget, and personnel). Based on a task defined at the beginning of the workshop, the teams develop a product concept and implement it along a structured development process. The focus lies less on the design's complexity and more on the exemplary experience with typical tasks and challenges encountered throughout the development process, such as role and task allocation, workflow definition, bill of materials, version and data management, as well as project and time planning.

In parallel, students translate their concepts into mechanical designs using CAD software (e.g., Autodesk Fusion 360), with particular emphasis on creating assemblies. At least two components need to be manufactured using additive manufacturing methods (3D printing), while also providing basic insights into classical CAD design of individual parts. The designed components are assembled into a mechatronic prototype that may include basic electronic and software-based functionality. The control system of the prototype is implemented by the students.

The entire development process is documented, regularly reflected upon in milestone presentations, and finally presented in a final presentation, including a live demonstration of the prototype.

Learning Objectives

After successfully completing the module, students are able to:

- Work effectively in interdisciplinary teams and define roles, workflows, and responsibilities
- Develop a technical prototype under realistic constraints (time and resources)
- Create simple part designs with CAD, optimised for 3D printing
- Create CAD models of assemblies and integrate them into a coherent development process
- Conceive, build, and evaluate simple mechatronic systems
- Document and present project results in a clear and marketing-oriented manner

Additional Information

The number of participants is limited. Information on the application process is available in ILIAS.

Organizational Information

A project-based workshop with collaborative group work requiring regular attendance and active participation. Details regarding the schedule, assessment criteria, and milestones will be announced at the beginning of the course.

See further details on course organisation at: teaching.imi.kit.edu and in ILIAS.

Workload 120 hours

- regular attendance: 60 hours
- self-study and project work: 60 hours

Organizational issues

See ILIAS for time and location / Zeit und Ort siehe ILIAS

T 7.38 Module component: CAE-Basics [T-MACH-113507]

Coordinators: Prof. Dr.-Ing. Tobias Düser
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-107658 - Data Driven Engineering Fundamentals

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	3 CP	graded	Each winter term	1 semesters	3

Courses					
WT 25/26	2145160	CAE-Basics	3 SWS	Lecture / Practice /	Düser
Exams					
WT 25/26	76-T-MACH-113507	CAE-Basics			Düser
ST 2026	76-T-MACH-113507	CAE-Basics			Düser

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Assessment
Written exam with a duration of 60 minutes.

Prerequisites
Admission to the exam only with successful completion of CAE-Basics Workshop

Recommendations
Knowledge of the lectures "Mechanical Design A" and "Engineering Mechanics 1" is assumed.

Additional Information
The course is offered in English.

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V CAE-Basics

2145160, WS 25/26, 3 SWS, Language: English, Open in study portal

Lecture / Practice (VÜ)
On-Site

Content

- Fundamentals of Computer Aided Design (CAD)
- Parameter-based modeling of assemblies
- Introduction to Finite Element Analysis (FEA)
- Strength and deformation analysis of solids using FE models

The course is offered in English.

Organizational issues
Zusätzlich zum Besuch der Lehrveranstaltungen sind praktische Übungen eigenständig zu bearbeiten.

In addition to attending the courses, practical exercises must be completed independently.

T 7.39 Module component: CAE-Basics Workshop [T-MACH-113899]

Coordinators: Prof. Dr.-Ing. Tobias Düser
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-107658 - Data Driven Engineering Fundamentals

Type	Credits	Grading	Term offered	Expansion	Version
Coursework (practical)	1 CP	pass/fail	Each winter term	1 semesters	2

Courses					
WT 25/26	2145160	CAE-Basics	3 SWS	Lecture / Practice / 🗣	Düser
Exams					
WT 25/26	76-T-MACH-113899	CAE-Basics Workshop			Düser

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Successful solution of an individual computer task that includes the practical content from the CAD and FEM exercises. Details are given in the lecture "CAE-Basics". Passing this course allows to register to the exam "CAE-Basics" (see T-MACH-113507). No on-site attendance required.

Prerequisites
None

Recommendations
None

Additional Information
The course is offered in English.

Workload
30 hours

Below you will find excerpts from courses related to this module component:

V CAE-Basics

2145160, WS 25/26, 3 SWS, Language: English, Open in study portal

Lecture / Practice (VÜ)
On-Site

Content

- Fundamentals of Computer Aided Design (CAD)
- Parameter-based modeling of assemblies
- Introduction to Finite Element Analysis (FEA)
- Strength and deformation analysis of solids using FE models

The course is offered in English.

Organizational issues
Zusätzlich zum Besuch der Lehrveranstaltungen sind praktische Übungen eigenständig zu bearbeiten.

In addition to attending the courses, practical exercises must be completed independently.

T 7.40 Module component: Civil Law for Beginners [T-INFO-103339]

Coordinators: Dr. Yvonne Matz
Organisation: KIT Department of Informatics
Part of: M-INFO-105084 - Public and Civil Law

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each winter term	3

Courses					
WT 25/26	2424012	Civil Law for Beginners	4 SWS	Lecture / 🗣	Matz
Exams					
WT 25/26	7500012	Civil Law for Beginners			Matz
ST 2026	7500041	Civil Law for Beginners			Matz

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 7.41 Module component: Climatology [T-PHYS-101092]

Coordinators: Prof. Dr. Joaquim José Ginete Werner Pinto
Organisation: KIT Department of Physics
Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Term offered	Version
Coursework	1 CP	pass/fail	Each summer term	4

Courses					
ST 2026	4051111	Klimatologie	3 SWS	Lecture / 🗣	Ginete Werner Pinto
ST 2026	4051112	Übungen zu Klimatologie	1 SWS	Practice / 🗣	Ginete Werner Pinto, Christ, Dillerup, NN

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Prerequisites
none

Workload
120 hours

T 7.42 Module component: CO2-Neutral Combustion Engines and their Fuels I [T-MACH-111550]

Coordinators: Prof. Dr. Thomas Koch
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101275 - Combustion Engines I

Type	Credits	Grading	Term offered	Expansion	Version
Oral examination	5 CP	graded	Each winter term	1 semesters	2

Courses					
WT 25/26	2133113	CO2-neutral combustion engines and their fuels I	3 SWS	Lecture / Practice / 🗣	Koch
Exams					
WT 25/26	76-T-MACH-102194	CO2-neutral combustion engines and their fuels I			Kubach, Koch
ST 2026	76-T-MACH-102194	CO2-neutral combustion engines and their fuels I			Koch

Legend: Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral examination, Duration: 25 min., no auxiliary means

Prerequisites
none

Additional Information
This course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V CO2-neutral combustion engines and their fuels I

2133113, WS 25/26, 3 SWS, Language: German, Open in study portal

Lecture / Practice (VÜ)
On-Site

Organizational issues
Übungstermine Donnerstags nach Bekanntgabe in der Vorlesung

T 7.43 Module component: CO2-Neutral Combustion Engines and their Fuels II [T-MACH-111560]

Coordinators: Prof. Dr. Thomas Koch
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-101303 - Combustion Engines II

Type	Credits	Grading	Term offered	Version
Oral examination	5 CP	graded	Each summer term	4

Courses					
ST 2026	2134151	CO2-neutral combustion engines and their fuels II	3 SWS	Lecture / Practice / 🗣	Koch
Exams					
WT 25/26	76-T-MACH-104609	Combustion Engines, Hydrogen Engines and CO2 neutral Fuels II			Kubach, Koch
ST 2026	76-T-MACH-104609	Combustion Engines, Hydrogen Engines and CO2 neutral Fuels II			Koch

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral examination, duration: 25 minutes, no auxiliary means

Prerequisites
none

Recommendations
Fundamentals of Combustion Engines II helpful

Additional Information
This course is offered in German.

Workload
150 hours

Below you will find excerpts from courses related to this module component:

V CO2-neutral combustion engines and their fuels II

2134151, SS 2026, 3 SWS, Language: German, Open in study portal

Lecture / Practice (VÜ)
On-Site

T 7.44 Module component: Competition in Networks [T-WIWI-100005]

Coordinators: Prof. Dr. Kay Mitusch
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101499 - Applied Microeconomics
M-WIWI-101668 - Economic Policy I

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	3

Courses					
WT 25/26	2561204	Competition in Networks	2 SWS	Lecture /	Mitusch
WT 25/26	2561205	Übung zu Wettbewerb in Netzen	1 SWS	Practice /	Mitusch, Corbo
Exams					
WT 25/26	7900221	Competition in Networks			Mitusch

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Result of success is made by a 60 minutes written examination during the semester break (according to §4(2), 1 ERSC). Examination is offered every semester and can be retried at any regular examination date.

Prerequisites
None.

Recommendations
Basics of microeconomics obtained within the undergraduate programme (B.Sc) of economics are required.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Competition in Networks

2561204, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Content
Network or infrastructure industries like telecommunication, transport, and utilities form the backbone of modern economies. The lecture provides an overview of the economic characteristics of network industries. The planning of networks is complicated by the multitude of aspects involved (like spatial differentiation and the like). The interactions of different companies - competition or cooperation or both - are characterized by complex interdependencies within the networks: network effects, economies of scale, effects of vertical integration, switching costs, standardization, compatibility etc. appear increasingly in these sectors and even tend to appear in combination. Additionally, government interventions can often be observed, partly driven by the aims of competition policy and partly driven by the aims industrial policy. All these issues are brought up, analyzed formally (in part) and illustrated by several examples in the lecture

Literature
Literatur und Skripte werden in der Veranstaltung angegeben.

T 7.45 Module component: Computational Macroeconomics [T-WIWI-112723]

Coordinators: Prof. Dr. Johannes Brumm
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-106472 - Advanced Macroeconomics

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	2

Courses					
ST 2026	2500162	Computational Macroeconomics	2 SWS	Lecture / 🗣	Schang, Brumm
ST 2026	2500164	Übung zu Computational Macroeconomics	1 SWS	Practice / 🗣	Schang
Exams					
WT 25/26	7900076	Computational Macroeconomics			Brumm

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment takes place in the form of a written 60 min. examination during the lecture-free period of the semester. The examination is offered every semester and can be repeated at any regular examination date.

Prerequisites
None

Additional Information
New lecture starting summer semester 2024.

Workload
135 hours

T 7.46 Module component: Constitution and Properties of Wearresistant Materials [T-MACH-102141]

Coordinators: Prof. Sven Ulrich
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101262 - Emphasis Materials Science

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each summer term	3

Courses					
ST 2026	2194643	Constitution and Properties of Wear resistant materials	2 SWS	Lecture / 🗣	Ulrich
Exams					
WT 25/26	76-T-MACH-102141	Constitution and Properties of Wearresistant Materials			Ulrich

Legend: 🖥 Online, ✣ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral examination (about 30 min)

no tools or reference materials

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Constitution and Properties of Wear resistant materials

Lecture (V)
On-Site

2194643, SS 2026, 2 SWS, Language: German, Open in study portal

Content
The assessment consists of an oral exam (ca. 30 min) taking place at the agreed date (according to Section 4(2), 2 of the examination regulation). The re-examination is offered upon agreement.

Teaching Content:

introduction

materials and wear

unalloyed and alloyed tool steels

high speed steels

stellites and hard alloys

hard materials

hard metals

ceramic tool materials

superhard materials

new developments

regular attendance: 22 hours
self-study: 98 hours

Basic understanding of constitution of wear-resistant materials, of the relations between constitution, properties and performance, of principles of increasing of hardness and toughness of materials as well as of the characteristics of the various groups of wear-resistant materials.

Recommendations: none

Organizational issues
Die Blockveranstaltung findet in folgendem Zeitraum statt:

26.05./27.05.2026: jeweils von 8:00-19:00 Uhr sowie

28.05.2026: 8:00-13:00 Uhr

Ort: KIT-CN, Geb. 681, Raum 214

Anmeldung verbindlich bis zum 24.05.2026 unter sven.ulrich@kit.edu.

Nach der Anmeldung wird Ihnen im Falle einer Online-Veranstaltung der Link zur Vorlesung per E-Mail am 25.05.2026 mitgeteilt.

Literature
Laska, R. Felsch, C.: Werkstoffkunde für Ingenieure, Vieweg Verlag, Braunschweig, 1981

Schedler, W.: Hartmetall für den Praktiker, VDI-Verlage, Düsseldorf, 1988

Schneider, J.: Schneidkeramik, Verlag moderne Industrie, Landsberg am Lech, 1995

Kopien der Abbildungen und Tabellen werden verteilt; Copies with figures and tables will be distributed

T 7.47 Module component: Construction Technology [T-BGU-101691]

Coordinators: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101004 - Fundamentals of Construction

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	6 CP	graded	Each term	1 semesters	1

Courses					
ST 2026	6200410	Construction Technology	3 SWS	Lecture / 🗣	Gentes, Haghsheno, Schneider
ST 2026	6200411	Exercises to Construction Technology	1 SWS	Practice / 🗣	Gentes, Haghsheno, Schneider, Waleczko
Exams					
WT 25/26	8230101691	Construction Technology			Haghsheno, Gentes, Schneider

Legend: 📱 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
written exam with 75 minutes

Prerequisites
None

Recommendations
None

Additional Information
None

Workload
180 hours

T 7.48 Module component: Consumer Psychology [T-WIWI-114292]

Coordinators: Prof. Dr. Benjamin Scheibehenne
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101424 - Foundations of Marketing

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each summer term	1

Assessment
The assessment of success takes the form of a presentation (weighting 30%) as part of the exercise, evaluations of weekly assignments throughout the semester (30%) and a written examination (90 minutes, weighting 40%). The details of the assessment will be announced at the beginning of the course.

Prerequisites
None.

Additional Information
Please note: Due to a research sabbatical of Prof. Scheibehenne, this course will not be offered in the summer semester 2026. The course is expected to be available again in the summer semester 2027.

Important information

Due to the interactive nature of the class, it is important to regularly participate in the weekly meetings and to regularly submit written assignments in preparation of these meetings. The assignments and active participation is part of the final grade. The 'Übung' associated with this course is mandatory: Students will be asked to do presentations in groups (introduce and discuss academic papers assigned by the lecturer). This will take place over one day (as a blocked event) during the semester (When and where will be announced at the beginning of the semester). The presentation also counts towards the final grade. There will be no weekly or bi-weekly Übung besides this event.

Goal

The goal of the class is to gain a better understanding of the psychological factors that influence consumer behavior. This includes situational, biological, cognitive, social, and evolutionary factors. We will address these questions from an interdisciplinary perspective. While the main focus is on theories from psychology, we will also incorporate relevant research from Marketing, Cognitive Science, Biology, and Economics.

Description

Just like Physics is an important foundation for Engineering, Psychology is an important basis for Economics, Management, and Marketing. Hence, getting a better understanding of the 'human condition' provides deeper insights into economic theory. This is particularly true for consumer behavior. Consumer decisions are ubiquitous in daily life, and they can have long-ranging and important consequences for individual (financial) well-being and health but also for societies and the planet as a whole. We will explore how consumer behavior is shaped by social influences, situational and cognitive constraints, as well as by emotions, motivations, evolutionary forces, neuronal processes, and individual differences. Across all topics covered in class, we will engage with basic theoretical work as well as with groundbreaking empirical research and current scientific debates. The class will be taught in English.

Grading

Grading is based on three pillars: Active participation during the semester (homework assignments, in-class participation, 30%), your presentation in the Übung (30%) and a written exam at the end of the semester (40%). The grading of the homework will be based on two randomly selected weeks throughout the semester. The exam will cover the content of the class. The exam questions will be in English. You are allowed to bring a language dictionary into the exam, but you are not allowed to bring notes. Details about the content and the format of the exam will be announced in the lecture. All part-grades and the final grade will be communicated by the end of the semester.

Workload

The total workload for this course is approximately 135 hours:

Presence time: 30 hours

Preparation and wrap-up of the course: 45 hours

Exam and exam preparation: 60 hours

For further information, please contact the research group Cognition and Consumer Behavior (http://cub.iism.kit.edu/).

Workload
135 hours

T 7.49 Module component: Control of Mobile Machines [T-MACH-111821]

Coordinators: Simon Becker
Prof. Dr.-Ing. Marcus Geimer

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Automotive Engineering
M-MACH-101267 - Mobile Machines

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each summer term	3

Exams			
ST 2026	76-T-MACH-111821	Control of mobile machines	Becker

Assessment
The assessment consists of an oral exam (approx. 20 min) taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
A prerequisite for participation in the examination is the preparation of a semester report. T-MACH-111820 must be passed.

Additional Information
The course is offered in German.

Workload
120 hours

T 7.50 Module component: Control of Mobile Machines – Prerequisites [T-MACH-111820]

Coordinators: Simon Becker
Prof. Dr.-Ing. Marcus Geimer

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Automotive Engineering
M-MACH-101267 - Mobile Machines

Type	Credits	Grading	Term offered	Version
Coursework	0 CP	pass/fail	Each summer term	1

Exams			
ST 2026	76-T-MACH-111820	Control of mobile machines - Advance	Becker, Geimer

Assessment
Preparation of a report on the completion of the semester task

Prerequisites
none

Additional Information
The course is offered in German.

7.51 Module component: Control Technology [T-MACH-105185]

Coordinators: Dr.-Ing. Philipp Gönnheimer
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	graded	Each summer term	2

Courses					
ST 2026	2150683	Control Technology	2 SWS	Lecture / 🗣	Gönnheimer
Exams					
WT 25/26	76-T-MACH-105185	Control Technology			Gönnheimer

Legend: 🖥 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written Exam (60 min)

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

Control Technology

2150683, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The lecture control technology gives an integral overview of available control components within the field of industrial production systems.
The first part of the lecture deals with the fundamentals of signal processing and with control peripherals in the form of sensors and actors which are used in production systems for the detection and manipulation of process states.
The second part handles with the function of electric control systems in the production environment. The main focus in this chapter is laid on programmable logic controls, computerized numerical controls and robot controls. Finally the course ends with the topic of cross-linking and decentralization with the help of bus systems.
The lecture is very practice-oriented and illustrated with numerous examples from different branches.

The following topics will be covered:

- Signal processing
- Control peripherals
- Programmable logic controls
- Numerical controls
- Controls for industrial robots
- Distributed control systems
- Field bus
- Trends in the area of control technology

Learning Outcomes:

The students ...

- are able to name the electrical controls which occur in the industrial environment and explain their function.
- can explain fundamental methods of signal processing. This involves in particular several coding methods, error protection methods and analog to digital conversion.
- are able to choose and to dimension control components, including sensors and actors, for an industrial application, particularly in the field of plant engineering and machine tools. Thereby, they can consider both, technical and economical issues.
- can describe the approach for projecting and writing software programs for a programmable logic control named Simatic S7 from Siemens. Thereby they can name several programming languages of the IEC 1131.

Workload:

regular attendance: 21 hours
self-study: 99 hours

Organizational issues
Zur Vertiefung des im Rahmen der Lehrveranstaltung erworbenen Wissens werden die theoretischen Vorlesungseinheiten durch Praxiseinheiten im Umfeld der Karlsruher Forschungsfabrik (https://www.karlsruher-forschungsfabrik.de) unterstützt.

The theoretical lectures are complemented by practical lectures in the Karlsruhe Research Factory (https://www.karlsruher-forschungsfabrik.de/en.html) to deepen the acquired knowledge.

Literature
Medien:
Skript zur Veranstaltung wird über ilias (https://ilias.studium.kit.edu/) bereitgestellt.

Media:
Lecture notes will be provided in ilias (https://ilias.studium.kit.edu/).

T 7.52 Module component: Conveying Technology and Logistics [T-MACH-102135]

Coordinators: Prof. Dr.-Ing. Kai Furmans
Organisation: KIT Department of Mechanical Engineering

Part of: M-WIWI-101816 - Seminar Module

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each summer term	1

Courses					
WT 25/26	2119100	Fördertechnik und Logistiksysteme		Seminar / 🗣	Furmans
ST 2026	2119100	Fördertechnik und Logistiksysteme	2 SWS	Seminar / 🗣	Furmans
Exams					
WT 25/26	76-T-MACH-102135	Conveying Technology and Logistics			Furmans

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, x Cancelled

Assessment
alternative test achievement (graded):

- written elaboration (workload of at least 80 h)
- oral presentation (approx. 30 min)

Prerequisites
none

Additional Information
The course is offered in German.

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V Fördertechnik und Logistiksysteme
Seminar (S)
On-Site
2119100, WS 25/26, SWS, Language: German/English, Open in study portal

Content
The goal of the seminar is to deal with different topics related to the materials handling and logistics. Depending on the topic, the students can work on the either alone or in a group. At the end the results are presented and discussed with a final presentation. To prepare the work for the seminar an introductory event is scheduled at the beginning.

Organizational issues
Weiteres siehe Homepage

V Fördertechnik und Logistiksysteme
Seminar (S)
On-Site
2119100, SS 2026, 2 SWS, Language: German/English, Open in study portal

Content
The goal of the seminar is to deal with different topics related to the materials handling and logistics. Depending on the topic, the students can work on the either alone or in a group. At the end the results are presented and discussed with a final presentation. To prepare the work for the seminar an introductory event is scheduled at the beginning.

Organizational issues
Ort: Gebäude 50.38, Raum 0.22, Termine siehe Homepage

T 7.53 Module component: Data Science Fundamentals in Engineering [T-MACH-114078]

Coordinators: Prof. Dr.-Ing. Anne Meyer
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-107658 - Data Driven Engineering Fundamentals

Type	Credits	Grading	Term offered	Expansion	Version
Examination of another type	4 CP	graded	Each winter term	1 semesters	2

Courses					
WT 25/26	2121360	Data Science Fundamentals in Engineering	3 SWS	Lecture / Practice / 🗣	Meyer
Exams					
WT 25/26	76-T-MACH-114078	Data Science Fundamentals in Engineering			Meyer

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Graded examination of another type; for further information, see ILIAS.

Additional Information
The course is offered in English.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Data Science Fundamentals in Engineering

2121360, WS 25/26, 3 SWS, Language: English, Open in study portal

Lecture / Practice (VÜ)
On-Site

Content

Data science and data-driven methods are an essential component of modern engineering and affect all stages of the product lifecycle, from data-supported product design to production, quality assurance, and intelligent or autonomous technical systems. This module introduces fundamental concepts, methods, and workflows of data science and machine learning with a strong focus on engineering applications.

Students gain an understanding of engineering-specific data characteristics and learn how to design and implement basic data analysis and machine learning pipelines. A central component of the course is practical group work on two data science and machine learning challenges using engineering data sets. Students apply state-of-the-art Python libraries to explore data, build models, and evaluate their performance.

The topics of this course include:

- Engineering data sources, data types, data quality, and data representation
- Data science workflows, exploratory data analysis, and visualization
- Statistical modeling and machine learning methods (regression, classification, clustering)
- Model training, evaluation, validation, and generalization
- Overfitting, model selection, and hyperparameter optimization
- Machine learning pipelines and practical implementation aspects
- Fundamentals of deep learning and neural networks for engineering applications

This module provides foundational competencies for subsequent courses in data-driven engineering, machine learning, and artificial intelligence.

Learning Objectives

After successful completion of the module, students are able to:

- **Explain** the role of data science, machine learning, and deep learning in engineering and their complementarity to simulation- and optimization-based approaches.
- **Analyze** engineering data sets with respect to data quality, structure, and suitability for data-driven, learning-based methods.
- **Apply** exploratory data analysis, statistical modeling, machine learning, and basic deep learning methods to engineering problems.
- **Design and implement** data analysis, machine learning, and deep learning pipelines using state-of-the-art Python libraries.
- **Evaluate** the performance, generalization capability, and limitations of machine learning and deep learning models using appropriate validation techniques.

Organizational Information

See further details on course organization at: lehre.imi.kit.edu and in ILIAS

Workload

120 hours

Organizational issues

The exercises take place on Wednesdays on specific days from 9:45 a.m. to 1:00 p.m. For further information, see ILIAS.

T 7.54 Module component: Data-Driven Algorithms in Vehicle Technology [T-MACH-112126]

Coordinators: Dr. Stefan Scheubner
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-101265 - Vehicle Development
M-MACH-101266 - Automotive Engineering

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	4 CP	graded	Each winter term	1 semesters	2

Courses					
WT 25/26	2113840	Data-Driven Algorithms in Vehicle Technology	2 SWS	Lecture /	Scheubner
Exams					
WT 25/26	76-T-MACH-112126	Data-Driven Algorithms in Vehicle Technology			Scheubner
ST 2026	76-T-MACH-112126	Data-Driven Algorithms in Vehicle Technology			Scheubner

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Written Examination

Duration: 90 minutes

Additional Information
The course is offered in English.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Data-Driven Algorithms in Vehicle Technology

2113840, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Content
Course Syllabus: Data-Driven Algorithms in Vehicle Technology
Motivation for the Course: Nowadays, engineers often develop technical systems using a combination of hard- and software. This is true especially for modern passenger vehicle development. In a digitalized world, such developments are built on knowledge gained from relevant data sources, e.g. the vehicle sensors. Therefore, engineers in automobile technology need qualifications from data science to successfully create new functionalities in the cars. To prevent remaining purely theoretical, the algorithms in this course are explained using a real-world problem of “EV Routing”. Students have the opportunity to test methods in Python with frequent exercises presented.
Goal of the Course: Students have a basic understanding of data-driven algorithms such as Markov Models, Machine Learning or Monte-Carlo Methods. The approach for building data-driven models in automobile technology are known to students and they are able to test algorithms in the programming language “Python”. Furthermore, students have learnt how to analyse the algorithm performance.
Content:
1. Introduction to function development as well as the prerequisites for the course (e.g. Fundamentals for running Python code)
2. Fundamentals for EV Routing and relevant data sources
3. Parameter estimation and state classification algorithms to determine the current situation of the vehicle
4. Learning methods for driver behaviour
5. Forecast algorithms to predict future energy consumption of an electric vehicle

Organizational issues

Das Vorlesungsmaterial wird auf ILIAS bereitgestellt. Das ILIAS-Passwort erhalten Sie unter https://fast-web-01.fast.kit.edu/PasswoerterIlias/

Die erste VL am 12.11.2025 um 14:00 Uhr findet in Präsenz am Campus Ost, Geb. 70.04, Raum 220 statt.

Alle weiteren Vorlesungsinhalte werden als Videoaufzeichnungen in ILIAS bereit gestellt. In regelmäßigen Abständen wird es Sprechstunden geben. Die genauen Termine erfahren Sie dann über den entsprechenden ILIAS Kurs

T 7.55 Module component: Derivatives [T-WIWI-102643]

Coordinators: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101402 - eFinance
M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	1

Courses					
ST 2026	2530550	Derivatives	2 SWS	Lecture / 🗣	Uhrig-Homburg
ST 2026	2530551	Übung zu Derivate	1 SWS	Practice / 🗣	Dinger, Uhrig-Homburg
Exams					
WT 25/26	7900051	Derivatives			Uhrig-Homburg
ST 2026	7900111	Derivatives			Uhrig-Homburg

Legend: 📱 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Success is assessed in the form of a written examination (60 minutes). The examination is offered every semester and can be repeated at any regular examination date.

A bonus can be earned for successful participation in the exercises by submitting correct solutions to at least 50% of the bonus exercises set. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

Prerequisites
None

Recommendations
None

Below you will find excerpts from courses related to this module component:

V Derivatives
2530550, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Literature

- Hull (2012): Options, Futures, & Other Derivatives, Prentice Hall, 8th Edition

Weiterführende Literatur:

Cox/Rubinstein (1985): Option Markets, Prentice Hall

T 7.56 Module component: Design and Development of Mobile Machines [T-MACH-105311]

Coordinators: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101267 - Mobile Machines

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each winter term	1

Courses					
WT 25/26	2113079	Design and Development of Mobile Machines	2 SWS	Lecture / 🗣	Geimer
Exams					
WT 25/26	76-T-MACH-105311	Design and Development of Mobile Machines			Geimer
ST 2026	76-T-MACH-105311	Design and Development of Mobile Machines			Geimer

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of an oral exam (20 min) taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

A registration is mandatory, the details will be announced on the webpages of the *Institute of Vehicle System Technology / Institute of Mobile Machines*. In case of too many applications, attendance will be granted based on pre-qualification.

The course will be replenished by interestung lectures of professionals from leading hydraulic companies.

Prerequisites
Required for the participation in the examination is the preparation of a report during the semester. T-MACH-108887 must have been passed.

Recommendations
Prior attendance of a course in the field of fluid technology, for example Fluid Power[2113092] or Mathematical Methods of Hydraulics[2113090], is recommended."

Additional Information
After completion of the lecture, studens can:

- design working and travel drive train hydraulics of mobile machines and can derive characteristic key factors.
- choose and apply suitable state of the art designing methods succesfully
- analyse a mobile machines and break its structure down from a complex system to subsystems with reduced complexity
- identify and desrcibe interactions and links between subsystems of a mobile maschine
- present and document solutions of a technical problem according to R&D standards

The number of participants is limited.

Conent:

The working scenario of a mobile machine depends strongly on the machine itself. Highly specialised machines, e.g. pavers are also as common as universal machines with a wide range of applications, e.g. hydraulic excavators. In general, all mobile machines are required to do their intended work in an optimal way and satisfy various critera at the same time. This makes designing mobile machines to a great and interesting challenge. Nevertheless, usually key factors can be derived for every mobile machine, which affect all other machine parameters. During this lecture, those key factors and designing mobile machines accordingly will be adressed. To do so, an exemplary mobile machine will be discussed and designed in the lecture an as a semester project.

Literature:

See german recommendations

The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V **Design and Development of Mobile Machines**
2113079, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
Excavators and wheel loaders are highly specialized mobile machines. Their function is to loosen and pick up material and place/ dump it again at a short distance.
The decisive factor for dimensioning is the capacity of the standard bucket. Using a wheel loader or excavator, the essential dimensioning steps for the design are worked through in this course. This includes, among other things

- Determining the size class and main dimensions,
- the dimensioning of an electric drive train,
- the design of the primary energy supply,
- determining the kinematics of the equipment,
- dimensioning the working hydraulics and
- strength calculations.

The entire sizing and design process for these machines is heavily influenced by the use of standards and guidelines. This aspect is also covered.

The course builds on knowledge from the fields of mechanics, strength of materials, machine elements, drive technology and fluid technology.
The course requires active participation and continuous involvement.

Recommendations:

Prior attendance of a course in the field of fluid technology, for example Fluid Power [2113092] or Mathematical Methods of Hydraulics [2113090], is recommended."

- Attendance time: 21 hours
- Self-study: 99 hours

Literature
Keine.

T 7.57 Module component: Design and Development of Mobile Machines - Advance [T-MACH-108887]

Coordinators: Prof. Dr.-Ing. Marcus Geimer
Jan Siebert

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101267 - Mobile Machines

Type	Credits	Grading	Term offered	Version
Coursework	0 CP	pass/fail	Each term	1

Exams			
WT 25/26	76-T-MACH-108887	Design and Development of Mobile Machines - Advance	Geimer
ST 2026	76-T-MACH-108887	Design and Development of Mobile Machines - Advance	Geimer

Assessment
Preparation of semester report

Prerequisites
none

Additional Information
The course is offered in German.

T 7.58 Module component: Development of Hybrid Drivetrains [T-MACH-110817]

Coordinators: Prof. Dr. Thomas Koch
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101303 - Combustion Engines II

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	graded	Each summer term	1

Courses					
ST 2026	2134155	Development of Hybrid Powertrains	2 SWS	Lecture / 🗣	Koch, Doppelbauer
Exams					
WT 25/26	76-T-MACH-110817	Development of hybrid drivetrains			Koch
ST 2026	76-T-MACH-110817	Development of hybrid drivetrains			Koch

Legend: 🖥 Online, ⚄ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral exam, 20 min.

Prerequisites
None

Additional Information
This course is offered in German.

Workload
120 hours

T 7.59 Module component: Digital Markets and Market Design [T-WIWI-112228]

Coordinators: Prof. Dr. Adrian Hillenbrand
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101499 - Applied Microeconomics

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2500035	Digital Markets and Market Design	2 SWS	Lecture / 🗣	Hillenbrand
WT 25/26	2500036	Digital Markets and Market Design	1 SWS	Practice / 🗣	Hillenbrand
Exams					
WT 25/26	7900016	Digital Markets and Market Design			Hillenbrand
WT 25/26	7900026	Digital Markets and Market Design			Hillenbrand

Legend: 🖥 Online, ✲ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Success is assessed in the form of a written examination (60 min.). The examination is only offered in the winter semester; two examination dates are offered during this period.

Prerequisites
None

Additional Information
The lecture will be held in English.

Below you will find excerpts from courses related to this module component:

V Digital Markets and Market Design
2500035, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
Online Markets determine our everyday lives. At the same time rapid technological advancements quickly change the landscape of online markets posing challenges for market design and consumer protection. In this course we apply theoretical economic models in the area of digital markets in order to make sense of current developments. Topics include consumer search, algorithmic pricing, recommender systems and steering, price discrimination and matching markets. We also discuss the potential effects of current policies like the Digital Markets Act and Digital Services Act on market outcomes.

V Digital Markets and Market Design
2500036, WS 25/26, 1 SWS, Language: English, Open in study portal

Practice (Ü)
On-Site

Content
Exercise Session for the course "Digital Markets and Market Design

Organizational issues
Jede zweite Woche eine Übung

T 7.60 Module component: Digital Markets and Mechanisms [T-WIWI-114598]

Coordinators: Dr. Frank Rosar
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101499 - Applied Microeconomics
M-WIWI-101501 - Economic Theory

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	1

Courses					
ST 2026	2560550	Digital Markets and Mechanisms	2 SWS	Lecture / 🗣	Rosar
ST 2026	2560551	Digital Markets and Mechanisms	1 SWS	Practice / 🗣	Rosar
Exams					
WT 25/26	7900007	Exam Digitale Märkte und Mechanismen (2)			Puppe
ST 2026	7900161	Exam Digitale Märkte und Mechanismen			Puppe

Legend: 🖥 Online, ❁ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

A bonus can be earned through successful participation in the excercise. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the course.

Prerequisites
None

Recommendations
Basic knowledge of microeconomics (in particular game theory) as well as statistics (especially the use of probabilities and expected values) is desirable, but not required.

Below you will find excerpts from courses related to this module component:

V Digital Markets and Mechanisms
Lecture (V)
On-Site

2560550, SS 2026, 2 SWS, Language: German, Open in study portal

Content
Auctions are a central instrument of the digital economy—sometimes visible, as on eBay, but also operating behind the scenes, for example automatically in the background of every Google search or in the price formation of electricity markets. But which strategic incentives shape the behavior of bidders? And how can auction mechanisms be designed to maximize efficiency or revenue?

This course conveys the theoretical foundations and methodological tools for analyzing and designing auctions and mechanisms. Students will learn equilibrium concepts of strategic interaction in auction markets, compare auction formats in terms of efficiency and revenue, and become familiar with the principles of (Bayesian) mechanism design. Mechanism design can be understood as the deliberate design of games to achieve specific economic objectives. The concepts and methods taught in this course are also applicable in many other economic contexts.

The course is aimed at students interested in the game-theoretic modeling of markets as well as in the design of economic incentive mechanisms and strategic games. The necessary game-theoretic foundations will be introduced in the course.

V Digital Markets and Mechanisms
Practice (Ü)
On-Site

2560551, SS 2026, 1 SWS, Language: German, Open in study portal

Content
See course description.

T 7.61 Module component: Digital Services: Foundations [T-WIWI-111307]

Coordinators: Dr. Carsten Holtmann
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101434 - eBusiness and Service Management
M-WIWI-102752 - Fundamentals of Digital Service Systems
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	3

Courses					
ST 2026	2595466	Digital Services: Foundations	2 SWS	Lecture / 🗣	Holtmann
ST 2026	2595467	Exercise Digital Services: Foundations	1 SWS	Practice / 🗣	Holtmann
Exams					
WT 25/26	7900034	Digital Services: Foundations			Satzger
ST 2026	7900079	Digital Services: Foundations			Satzger

Legend: 📱 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment of success takes place through a written exam (60 minutes) with additional aids (according to § 4(2), 1 SPO). Further details regarding the assessment of success will be announced during the lecture.

A bonus can be acquired by successful completion of a a practically-oriented assignment (written report + short in-class presentation) during the semester. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). Further details regarding the acquisition of a bonus will be announced at the beginning of the course.

Modeled Prerequisites
The following conditions have to be fulfilled:

1. The module component T-WIWI-109938 - Digital Services must not have been started.

Additional Information
The course will be offered as a pure in-person lecture starting in the summer semester of 2026.
Please check the announcements in the ILIAS forum.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Digital Services: Foundations

Lecture (V)
On-Site

2595466, SS 2026, 2 SWS, Language: English, Open in study portal

Content

The world has been moving towards “service-led” economies: In many developed countries, services already account for more than 70% of the gross domestic product. In order to design, engineer, and manage services, traditional “goods-oriented” business models are often inappropriate. At the same time, the rapid development of information and communication technology (ICT), such as Artificial Intelligence (AI), pushes “servitization” and the economic importance of digital services. This drives competition and opens up novel opportunities: Services can instantly be delivered anywhere across the globe; dynamic and scalable service ecosystems replace static value chains; increased interaction options allow “value co-creation” between providers and customers; and the analysis of big data enables service optimization and personalization.

Building on a systematic categorization of different types of services and on the general notion of “value co-creation”, we cover concepts for managing, developing, and analyzing digital services, as well as current technological advances in digital services, allowing for further specialization in master level courses. Topics in this course include an introduction to digital services, human-centered development of services, and service analytics based on big data. Additionally, we cover emerging technologies and trends as well as essential design concepts for AI-based services, such as bias and fairness in AI, explainable AI, and sovereign AI. Finally, the lecture lays the practical foundations for implementing, analyzing, and managing digital services at scale. Besides those contents, the lecture entails first-hand research insights, exercises and discussion sessions, and guest lectures from practitioners that will illustrate the relevance of digital services in today’s world.

Literature

- Bartelheimer, C., Heinz, D., Hönigsberg, S., et al. (2025). Conceptualizing hybrid intelligent service ecosystems. *Electronic Markets*, *35*, Article 63.
- Böhmann, T., Leimeister, J. M., & Möslein, K. (2014). Service systems engineering. Business & Information Systems Engineering,6(2), 73-79.
- Brasse, J., Broder, H. R., Förster, M., Klier, M., & Sigler, I. (2023). Explainable artificial intelligence in information systems: A review of the status quo and future research directions. *Electronic Markets*, *33*(1), 26.
- Cardoso, J., Fromm, H., Nickel, S., Satzger, G., Studer, R., & Weinhardt, C. (Eds.). (2015). Fundamentals of service systems (Vol. 12). Heidelberg: Springer.
- Fromm, H., Habryn, F., & Satzger, G. (2012). Service analytics: Leveraging data across enterprise boundaries for competitive advantage. In Globalization of professional services (pp. 139-149). Springer, Berlin, Heidelberg.
- Ostrom, A. L., Parasuraman, A., Bowen, D. E., Patrício, L., & Voss, C. A. (2015). Service research priorities in a rapidly changing context. Journal of Service Research, 18(2), 127-159.
- Spohrer, J., Maglio, P. P., Bailey, J., & Gruhl, D. (2007). Steps toward a science of service systems. Computer, 40(1), 71-77.
- Satzger, G., Benz, C., Böhmann, T., & Roth, A. (2022). Servitization and digitalization as “Siamese Twins”: Concepts and research priorities. In B. Edvardsson & B. Tronvoll (Eds.), *The Palgrave Handbook of Service Management*. Palgrave Macmillan.

7.62 Module component: Digitalization from Product Concept to Production [T-MACH-113647]

Coordinators: Dr.-Ing. Marc Wawerla
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Expansion	Version
Examination of another type	4 CP	graded	Each winter term	1 semesters	2

Courses					
WT 25/26	2149702	Digitalization from Product Concept to Production	2 SWS	Lecture / 🗣	Wawerla
Exams					
WT 25/26	76-T-MACH-113647	Digitalization from Product Concept to Production			Wawerla

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Alternative test achievement (graded):
- Written processing of a case study (weighting 50%) and
- Presentation of the results (ca. 10 min.) followed by a colloquium (ca. 30 min.) (weighting 50%)

Prerequisites
T-MACH-110176 may not have started.

Additional Information
The course is offered in English.

For organizational reasons, the number of participants in the course is limited. As a result, a selection process will be carried out for registrations. Further information on the course and application can be found via https://www.wbk.kit.edu/studium-und-lehre.php.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Digitalization from Product Concept to Production

Lecture (V)
On-Site

2149702, WS 25/26, 2 SWS, Language: English, Open in study portal

Content

The lecture covers digitalization along the entire value chain in technology companies. The focus is on production and the supply chain. In this context, concepts, tools, methods, technologies, and specific applications in industry are presented. As part of the course, students have the opportunity to gain insights into the digitalization processes of a German high-tech company.

Main topics of the lecture:

- Concepts and methods such as disruptive innovation and agile project management
- Overview of available technologies
- Practical approaches to innovation
- Applications in industry
- Excursion to ZEISS IQS

Learning Outcomes:

The students are able to …

- describe and explain the methods and concepts presented in the course.
- analyze and evaluate the suitability of digitalization technologies for value creation processes in the manufacturing industry.
- assess the applicability of methods such as disruptive innovation and agile project management.
- assess the practical challenges of digitalization in industry.

Workload:

regular attendance: 21 hours
self-study: 99 hours

Organizational issues

Aus organisatorischen Gründen ist die Anzahl der Teilnehmenden der Lehrveranstaltung begrenzt. Infolgedessen findet ein Auswahlprozess der Anmeldungen statt. Weitere Informationen zur Lehrveranstaltung und Bewerbung sind unter https://www.wbk.kit.edu/studium-und-lehre.php zu finden.

For organizational reasons, the number of participants in the course is limited. As a result, a selection process will carried out for registrations. Further information on the course and application can be found via https://www.wbk.kit.edu/studium-und-lehre.php.

T 7.63 Module component: Economics and Behavior [T-WIWI-102892]

Coordinators: Jun.-Prof. Dr. Wladislaw Mill
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101499 - Applied Microeconomics
M-WIWI-101501 - Economic Theory

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2560137	Economics and Behavior	2 SWS	Lecture / 🗣	Mill
WT 25/26	2560138	Übung zu Economics and Behavior	1 SWS	Practice / 🗣	Mill
Exams					
WT 25/26	7900134	Exam Economics and Behavior			Mill
ST 2026	7900154	Exam Economics and Behavior (2)			Mill, Puppe

Legend: 🖥 Online, ♻ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Recommendations
Basic knowledge of microeconomics and statistics are recommended. A background in game theory is helpful, but not absolutely necessary.

Additional Information
The lecture will be held in English.

Below you will find excerpts from courses related to this module component:

V Economics and Behavior

2560137, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
The course covers topics from behavioral economics with regard to contents and methods. In addition, the students gain insight into the design of economic experiments. Furthermore, the students will become acquainted with reading and critically evaluating current research papers in the field of behavioral economics.

The students

- gain insight into fundamental topics in behavioral economics;
- get to know different research methods in the field of behavioral economics;
- learn to critically evaluate experimental designs;
- get introduced to current research papers in behavioral economics;
- become acquainted with the technical terminology in English.

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

The grade will be determined in a final written exam. Students can earn a bonus to the final grade by successfully participating in the exercises.

The total workload for this course is approximately 135.0 hours. For further information see German version.

The lecture will be held in English.

Recommendations:

Basic knowledge of microeconomics and statistics are recommended. A background in game theory is helpful, but not absolutely necessary.

Literature
Kahnemann, Daniel: Thinking, Fast and Slow. Farrar, Straus and Giroux, 2011.

T 7.64 Module component: Economics I: Microeconomics [T-WIWI-102708]

Coordinators: Prof. Dr. Clemens Puppe
Prof. Dr. Johannes Philipp Reiß

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-100950 - Preliminary Exam
M-WIWI-101398 - Introduction to Economics

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each winter term	1

Courses					
WT 25/26	2610012	Economics I: Microeconomics	3 SWS	Lecture / 🗣	Puppe, Okulicz
WT 25/26	2610013		2 SWS	Tutorial / 🗣	Puppe, Okulicz
Exams					
WT 25/26	7900255	Economics I: Microeconomics			Puppe
WT 25/26	7900259	Economics I: Microeconomics			Puppe

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment

The assessment consists of a written exam (120 min) following §4, Abs. 2, 1 of the examination regulation.

The main exam takes place subsequent to the lectur. The re-examination is offered at the same examination period. As a rule, only repeating candidates are entitled for taking place the re-examination. For a detailed description on the exam regulations see the information of the respective chair.

Prerequisites

None

Below you will find excerpts from courses related to this module component:

V Economics I: Microeconomics

2610012, WS 25/26, 3 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
This course provides a solid grounding in microeconomic theory. The two main parts of the course deal with questions of microeconomic decision theory (household and firm decisions) and questions of market theory (equilibria and efficiency on competitive markets). The last part of the lecture deals with problems of imperfect competition (oligopoly markets) as well as the basics of game theory and welfare economics.

Learning objectives:
The main aim of the course is to teach students the basics of thinking in microeconomic models. In particular, students should be able to analyze goods markets and the determinants of market outcomes. In detail, students will learn

- to name and define the basic microeconomic terms.
- to explain the interrelationships in microeconomic models.
- to calculate the important parameters of microeconomic models.
- to judge the possible effects of economic policy measures on the behavior of economic agents (in simple decision problems) and possibly propose alternative measures.
- to analyze as a participant in a tutorial simple microeconomic problems by solving written exercises and presenting the results of the exercises on the blackboard.
- to become familiar with the basic literature on microeconomics.

In this way, students acquire the necessary basic knowledge

- to recognize the structure of economic problems on a microeconomic level and develop proposals for solutions.
- to provide active decision support for simple economic decision problems.

Workload:
Total workload for 5 credit points: approx. 150 hours
Attendance: 45 hours
Self-study: 105 hours

Literature

- Varian, H. R. 2016. *Grundzüge der Mikroökonomik*. 9. Auflage. De Gruyter Oldenburg Verlag.
- Pindyck, R. S. und Rubinfeld, D. L. 2015. *Mikroökonomie*. 8. Auflage. Pearson.
- Frank, R. H. 2006. *Microeconomics and Behavior*. 6. Auflage. McGraw-Hill/Irwin.

T 7.65 Module component: Economics II: Macroeconomics [T-WIWI-102709]

Coordinators: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101398 - Introduction to Economics

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each summer term	1

Courses					
ST 2026	2600014	Economics II: Macroeconomics	4 SWS	Lecture	Brumm
ST 2026	2660015	Economics II : Macroeconomics, Tutorial	2 SWS	Tutorial	Brumm, Kissling
Exams					
WT 25/26	790vwl2	Economics II: Macroeconomics			Wigger

Assessment
Success is assessed in the form of a written examination (120 minutes). The examination is offered every semester and can be repeated at any regular examination date.

Prerequisites
None

Below you will find excerpts from courses related to this module component:

V Economics II: Macroeconomics

Lecture (V)

2600014, SS 2026, 4 SWS, Language: German, Open in study portal

Content

Classical Theory of Macroeconomic Production

Chapter 1: Gross domestic product

Chapter 2: Money and Inflation

Chapter 3: Open Economy I

Chapter 4: Unemployment

Growth: The economy in the long term

Chapter 5: Growth I

Chapter 6: Growth II

Business cycle: The economy in the short term

Chapter 7: Economy and aggregate demand I

Chapter 8: Economy and aggregate demand II

Chapter 9: Open Economy II

Chapter 10: Macroeconomic supply

Advanced topics of macroeconomics

Chapter 11: Dynamic model of the economy as a whole

Chapter 12: Microeconomic foundations

Chapter 13: Macroeconomic economic policy

Learning goals:

The students. . .

- can name the basic indicators, technical terms and concepts of macroeconomics.
- can use models to reduce complex relationships to their basic components.
- can analyse economic policy debates and form their own opinion on them.

Workload:

Total effort for 5 credit points: approx. 150 hours

Presence time: 45 hours

Before and after the LV: 67.5 hours

Exam and exam preparation: 37.5 hours

Literature

Als Grundlage dieser Veranstaltung dient das bekannte Lehrbuch „Makroökonomik“ von Greg Mankiw vom Schäffer Poeschel Verlag in der aktuellen Fassung.

T 7.66 Module component: eFinance: Information Systems for Securities Trading [T-WIWI-110797]

Coordinators: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101402 - eFinance
M-WIWI-101423 - Topics in Finance II
M-WIWI-101434 - eBusiness and Service Management
M-WIWI-101465 - Topics in Finance I
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	2

Courses					
WT 25/26	2540454	eFinance: Information Systems for Securities Trading	2 SWS	Lecture / 🗣	Weinhardt
WT 25/26	2540455	Übungen zu eFinance: Information Systems for Securities Trading	1 SWS	Practice / 🗣	Motz, Motz
Exams					
WT 25/26	7900182	eFinance: Information Engineering and Management for Securities Trading			Weinhardt
ST 2026	7900269	eFinance: Information Systems for Securities Trading			Weinhardt

Legend: 🖥 Online, ❖ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Success is monitored by means of ongoing elaborations and presentations of tasks and an examination (60 minutes) at the end of the lecture period. The scoring scheme for the overall evaluation will be announced at the beginning of the course.

Modeled Prerequisites
The following conditions have to be fulfilled:

1. The module component T-WIWI-102600 - eFinance: Information Engineering and Management for Securities Trading must not have been started.

Additional Information
The course"eFinance: Information Systems for Securities Trading" covers different actors and their function in the securities industry in-depth, highlighting key trends in modern financial markets, such as Distributed Ledger Technology, Sustainable Finance, and Artificial Intelligence. Security prices evolve through a large number of bilateral trades, performed by market participants that have specific, well-regulated and institutionalized roles. Market microstructure is the subfield of financial economics that studies the price formation process. This process is significantly impacted by regulation and driven by technological innovation. Using the lens of theoretical economic models, this course reviews insights concerning the strategic trading behaviour of individual market participants, and models are brought market data. Analytical tools and empirical methods of market microstructure help to understand many puzzling phenomena in securities markets.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V eFinance: Information Systems for Securities Trading
2540454, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Literature

- Picot, Arnold, Christine Bortenlänger, Heiner Röhrl (1996): "Börsen im Wandel". Knapp, Frankfurt
- Harris, Larry (2003): "Trading and Exchanges - Market Microstructure for Practitioners"". Oxford University Press, New York

Weiterführende Literatur:

- Gomber, Peter (2000): "Elektronische Handelssysteme - Innovative Konzepte und Technologien". Physika Verlag, Heidelberg
- Schwartz, Robert A., Reto Francioni (2004): "Equity Markets in Action - The Fundamentals of Liquidity, Market Structure and Trading". Wiley, Hoboken, NJ

T 7.67 Module component: Electric Energy Systems [T-ETIT-112850]

Coordinators: Prof. Dr.-Ing. Marc Hiller
Prof. Dr.-Ing. Thomas Leibfried
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-106821 - Electric Energy Systems and Power Generation

Type	Credits	Grading	Term offered	Version
Written examination	6 CP	graded	Each summer term	1

Courses					
ST 2026	2306200	Electric Energy Systems	2 SWS	Lecture / 🗣	Hiller, Leibfried
ST 2026	2306201	Practice to Electric Energy Systems	2 SWS	Practice / 🗣	Hiller, Leibfried
Exams					
WT 25/26	7306200	Electric Energy Systems			Leibfried, Hiller
ST 2026	7306200	Electric Energy Systems			Leibfried, Hiller

Legend: 🖥 Online, ✲ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Prerequisites
none

T 7.68 Module component: Electrical Engineering for Business Engineers, Part I [T-ETIT-100533]

Coordinators: Dr.-Ing. Matthias Brodatzki
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101155 - Electrical Engineering

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each winter term	1

Courses					
WT 25/26	2304223	Electrical Engineering for Business Engineers, Part I	2 SWS	Lecture / 🗣	Brodatzki, Beck
WT 25/26	2304225	Electrical Engineering for Business Engineers, Part I (Exercise to 2304223)	2 SWS	Practice / 🗣	Brodatzki
Exams					
WT 25/26	7304223	Electrical Engineering for Business Engineers, Part I			Brodatzki, Menesklou
ST 2026	7304223	Electrical Engineering for Business Engineers, Part I			Menesklou, Brodatzki

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 7.69 Module component: Electrical Engineering for Business Engineers, Part II [T-ETIT-100534]

Coordinators: Dr.-Ing. Matthias Brodatzki
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-MACH-101261 - Emphasis in Fundamentals of Engineering
M-WIWI-101839 - Additional Fundamentals of Engineering

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each summer term	1

Courses					
ST 2026	2304224	Elektrotechnik II für Wirtschaftsingenieure	3 SWS	Lecture / 🗣	Brodatzki
Exams					
WT 25/26	7304224	Electrical Engineering for Business Engineers, Part II			Menesklou
ST 2026	7304224	Electrical Engineering for Business Engineers, Part II			Menesklou, Brodatzki

Legend: 🖥 Online, ✣ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 7.70 Module component: Energy Policy [T-WIWI-102607]

Coordinators: Prof. Dr. Martin Wietschel
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101464 - Energy Economics

Type	Credits	Grading	Term offered	Version
Written examination	3,5 CP	graded	Each summer term	3

Courses					
ST 2026	2581959	Energy Policy	2 SWS	Lecture / 🗣	Wietschel
Exams					
WT 25/26	7981959	Energy Policy			Wietschel
ST 2026	7981959	Energy Policy			Fichtner

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (60 minutes) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None.

Below you will find excerpts from courses related to this module component:

V Energy Policy
2581959, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The availability of cheap, environmentally friendly and secure energy is crucial for human welfare. However, the increasing scarcity of resources and increasing environmental pressures, with a particular focus on climate change, threaten human welfare through economic action. Energy contributes significantly to environmental pollution. The energy industry is characterised by high regulation and a significant influence of political decisions.

At the beginning of the lecture different perspectives on energy policy will be presented and the analysis of political decision-making processes will be discussed. Then the current energy policy challenges in the area of environmental pollution, regulation and the role of energy for households and industry will be discussed. Then the actors of energy policy and energy responsibilities in Europe will be discussed. The economic approaches from traditional environmental economics and sustainability as a new policy approach will then be discussed. Finally, energy policy instruments such as the promotion of renewable energies or energy efficiency are discussed in detail and how they can be evaluated.

The lecture emphasizes the relationship between theory and practice and presents some case studies.

Literature
Wird in der Vorlesung bekannt gegeben.

T 7.71 Module component: Engine Measurement Techniques [T-MACH-105169]

Coordinators: Dr.-Ing. Sören Bernhardt
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101303 - Combustion Engines II

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each summer term	1

Courses					
ST 2026	2134137	Engine measurement techniques	2 SWS	Lecture / 🗣	Bernhardt
Exams					
WT 25/26	76-T-MACH-105169	Engine Measurement Techniques			Koch
ST 2026	76-T-MACH-105169	Engine Measurement Techniques			Bernhardt

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral examination, Duration: 0,5 hours, no auxiliary means

Prerequisites
none

Recommendations
T-MACH-102194 Combustion Engines I

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Engine measurement techniques

2134137, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Literature

1. Grohe, H.:Messen an Verbrennungsmotoren
2. Bosch: Handbuch Kraftfahrzeugtechnik
3. Veröffentlichungen von Firmen aus der Meßtechnik
4. Hoffmann, Handbuch der Meßtechnik
5. Klingenberg, Automobil-Meßtechnik, Band C

T 7.72 Module component: Enterprise Systems for Financial Accounting & Controlling [T-WIWI-113746]

Coordinators: Christian Fleig
Prof. Dr. Alexander Mädche

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-101434 - eBusiness and Service Management
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each winter term	2

Courses					
WT 25/26	2500060	Enterprise Systems for Financial Accounting & Controlling	3 SWS	Lecture / 🗣	Mädche, Fleig
Exams					
WT 25/26	7900074	Enterprise Systems for Financial Accounting & Controlling			Mädche
ST 2026	7900210	Enterprise Systems for Financial Accounting & Controlling			Mädche

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment

Success is assessed in the form of an alternative exam assessment. It consists of a one-hour exam and the implementation of a capstone project.

The final grade is made up of 60% of the exam grade and 40% of the capstone project grade.

Details on the structure of the assessment will be announced during the lecture.

Prerequisites

Keine.

Workload

135 hours

Below you will find excerpts from courses related to this module component:

V Enterprise Systems for Financial Accounting & Controlling

2500060, WS 25/26, 3 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content

Enterprise Systems building on enterprise resource planning (ERP) packaged software such as SAP S/4HANA are information systems that target large-scale integration of business processes and data across a company's functional areas. These systems are crucial for financial accounting and controlling as they enable organizations to streamline and integrate their financial operations, ensuring accurate decision-making based on real-time financial data. Contemporary packaged ERP software provide modules that integrate core business processes in financial accounting including general ledger, accounts receivable, payable and asset accounting. The information generated in these processes serves as a major source of cost-related decision-making, reporting and data analyses in internal accounting ("controlling"). Packaged ERP software typically rely on industry best practices captured in the form of product software with a standardized structure of master data. Thereby, they also support regulatory compliance and analyzability of processes in approaches such as process mining which enhances overall business efficiency and competitiveness. However, implementing enterprise systems in practice imposes substantial challenges to organizations.

First, the B.Sc. lecture "Enterprise Systems for Financial Accounting & Controlling" introduces fundamental business processes and concepts in finance and controlling and explains how these processes are implemented in packaged ERP software such as SAP S/4HANA. Students learn the basic and most important terms and master data structures in the SAP FI/CO module. Second, students learn about the principles of packaged ERP software, gaining hands-on experience SAP S4/HANA. Third, the lecture introduces the challenges in enterprise system projects such as SAP S/4HANA implementations, Fourth, students actively apply their knowledge in collaborative team efforts when working with exemplary SAP data in Microsoft SQL Server to analyze finance and controlling master data processes (capstone project)

Learning Objectives:

The students …

- understand modern business concepts of financial accounting & controlling for large enterprises
- the importance of enterprise systems supporting the implemention of modern business concepts
- know the underlying principles of packaged software for enterprise resource planning and process intelligence
- Understand the opportunities and challenges of Enterprise Systems implementation at large enterprises
- Get hands-on knowledge about financial accounting & controlling with commercial product software (e.g., SAP S4/HANA)
- Apply their knowledge on enterprise systems implementation for financial accounting and controlling on real-world data in team effort

T 7.73 Module component: Entrepreneurship Basics [T-WIWI-114637]

Coordinators: Prof. Dr. Orestis Terzidis
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-107451 - Entrepreneurial Thinking and Action: Fundamentals of Entrepreneurship

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2545010	Entrepreneurship Basics (Track 1)	3 SWS	Seminar / Blended	Hirte
WT 25/26	2545011	Entrepreneurship Basics (Track 2)	3 SWS	Seminar / Blended	Lau
ST 2026	2545010	Entrepreneurship Basics (Track 1)	3 SWS	Seminar / On-Site	Hirte, Terzidis
Exams					
WT 25/26	7900085	Entrepreneurship Basics (Track 1)			Terzidis
ST 2026	7900056	Entrepreneurship Basics (Track 1)			Terzidis

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
The assessment is conducted as an alternative exam assessment. The specific form of assessment depends on the course and may include, for example, the following components:

- **Project Report or Reflection Paper**
- **Mid-term and Final Presentation**
- **Group Work with Individual Contribution**
- **Active Participation and Mandatory Attendance**

The overall grade is determined by the weighted evaluation of these individual assessment components. The detailed weighting of these components for grade calculation will be communicated to students at the beginning of the course.

Prerequisites
None

Recommendations
An interest in entrepreneurial thinking and action, teamwork, and interdisciplinary project work is recommended. Basic knowledge in business administration and/or innovation methods is helpful but not required.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Entrepreneurship Basics (Track 1)

2545010, WS 25/26, 3 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content
Course Content:

This seminar explains important factors for becoming an entrepreneur and guides you through a structured process from the first business idea to a pitch of your final business model. Therefore, a business idea will be developed in the context of the UN Sustainable Development Goals. In small teams you create, develop, validate and present your business model. It simulates the basics of a start-up process up to the investor pitch.

Learning Objectives

After completing this course, the course participants will be able to

- Reflect on and define your personal and team core values
- Reflect on and define your personal and team competencies
- Reflect on and recall a definition for business opportunity
- Define your field of interest for opportunity recognition using the UN SDGs
- Analyze a specific domain to identify business opportunities
- Develop a first draft for your business model by using the Business Model Canvas
- Pitch / present your business idea

Credentials:

Registration is via the Wiwi portal.

Exam:

Presentation + active participation + paper.

Target group:

Bachelor students

Organizational issues
Registration is via the Wiwi portal.

In the seminar you will work on a project in teams of max. 5 persons. The groups are formed in the seminar

V	**Entrepreneurship Basics (Track 2)** 2545011, WS 25/26, 3 SWS, Language: English, Open in study portal	**Seminar (S)** **Blended (On-Site/Online)**

Content
Course Content:

This seminar provides a hands-on introduction to entrepreneurial thinking and acting. Students will be guided through a structured, evidence-based process, from identifying a first business idea to designing a validated business model. This simulates the early stages of a start-up journey, culminating in an investor-style pitch. Working in interdisciplinary teams, participants will ideate, test, and refine their concepts using real-world methods and tools.

Starting from team formation and problem exploration, students will learn how to discover and validate customer needs. They will design and test hypotheses through customer interviews and rapid experiments, build Value Proposition and Business Model Canvases, and analyze unit economics and go-to-market options.

The seminar emphasizes teamwork, evidence-based decision-making, and communication skills. By the end, each team will deliver a tested business concept, a concise pitch deck, and an investor-style presentation.

Learning Objectives

After completing this seminar, students will have learned and actually practiced the whole business model development process. In particular this means that students will know:

- Develop core entrepreneurial skills through practice.
- Understand how to create and validate customer value.
- Learn to derive, prioritize, and test business hypotheses.
- Translate ideas into viable business models and economics.
- Build and test low-fidelity prototypes to generate evidence.
- Gain experience in pitching and convincing stakeholders with evidence.

Format & Deliverables:

- 2.5 days of in-class sessions (inputs, team sprints, coaching).
- Homework assignments between sessions (interviews, experiments, prototyping, deck iterations).
- Final deliverables: team pitch, pitch deck, evidence dossier, and reflection.

Target group:

Bachelor students

Credentials:

Registration is via the Wiwi portal.

Organizational issues
Registration is via the Wiwi portal.

In the seminar you will work on a project in teams of 4-5 persons. The groups are formed in the seminar.

V	**Entrepreneurship Basics (Track 1)** 2545010, SS 2026, 3 SWS, Language: English, Open in study portal	**Seminar (S)** **On-Site**

Content
Content

This seminar explains important factors for becoming an entrepreneur and guides you through a structured process from the first business idea to a pitch of your final business model. Therefore, a business idea will be developed in the context of the UN Sustainable Development Goals. In small teams you create, develop, validate and present your business model. It simulates the basics of a start-up process up to the investor pitch.

Learning Objectives

After completing this course, the course participants will be able to

- Reflect on and define your personal and team core values
- Reflect on and define your personal and team competencies
- Reflect on and recall a definition for business opportunity
- Define your field of interest for opportunity recognition using the UN SDGs
- Analyze a specific domain to identify business opportunities
- Develop a first draft for your business model by using the Business Model Canvas
- Pitch / present your business idea

Exam:

Presentation + active participation + paper.

Target group:

Bachelor students

Organizational issues
Registration is via the Wiwi-Portal.

In the seminar you will work on a project in teams of max. 5 persons. The groups are formed in the seminar.

7.74 Module component: Exam on Climatology [T-PHYS-105594]

Coordinators: Prof. Dr. Joaquim José Ginete Werner Pinto
Organisation: KIT Department of Physics
Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Version
Oral examination	5 CP	graded	5

T 7.75 Module component: Examination Prerequisite Project Management [T-BGU-113454]

Coordinators: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101004 - Fundamentals of Construction

Type	Credits	Grading	Term offered	Expansion	Version
Coursework	0 CP	pass/fail	Each winter term	1 semesters	1

Courses					
WT 25/26	6200106	Project Management	2 SWS	Lecture / Practice / 🗣	Haghsheno, Schneider, Gloser
Exams					
WT 25/26	8231113454	Examination Prerequisite Project Management			Haghsheno, Schneider

Legend: 🖥 Online, 🔄 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
4 online tests during the course with 20 questions und 20 min. duration each

Prerequisites
none

Recommendations
none

Additional Information
none

Workload
5 hours

Below you will find excerpts from courses related to this module component:

V Project Management

6200106, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture / Practice (VÜ)
On-Site

Content
This course provides a comprehensive introduction to (construction) project management. It takes a closer look at the organisation and delivery of a construction project from the client's perspective. In this context, a range of competences are presented that should be on hand for the successful execution of project management. In addition, we present a selection of project management methods for individual competences and illustrate them with case studies.

Organizational issues
Vorlesungen: Mittwochs vom 29.10.2025 bis 18.02.2026, jeweils 09:45 – 11:15 Uhr (hybrid)

Übungen: Asynchron ab 19.11.2025, 10.12.2025, 14.01.2026, 11.02.2026 (online)

Literature

- AHRENS, Hannsjörg; BASTIAN, Klemens; MUCHOWSKI, Lucian (Hrsg.) (2021) *Handbuch Projektsteuerung - Baumanagement: Ein praxisorientierter Leitfaden mit zahlreichen Hilfsmitteln und Arbeitsunterlagen*, 6. Auflage, Fraunhofer IRB Verlag, Stuttgart
- GPM Deutsche Gesellschaft für Projektmanagement e. V. (Hrsg.) (2017) *Individual Competence Baseline für Projektmanagement (Version 4.0)*, 1. Auflage, GPM Deutsche Gesellschaft für Projektmanagement e. V., Nürnberg
- HAGHSHENO, Shervin; JOHN, Paul Christian (2024) *Bauherrnseitige Projektmanagement-Dienstleistungen in Deutschland*, Forschungsbericht, DVP – Deutscher Verband für Projektmanagement in der Bau- und Immobilienwirtschaft e. V.
- KOCHENDÖRFER, Bernd; LIEBCHEN, Jens H.; VIERING, Markus G. (2021) *Bau-Projekt-Management: Grundlagen und Vorgehensweisen*, 6. Auflage, Springer Vieweg, Wiesbaden
- SCHULZ, Markus (2020) *Projektmanagement: Zielgerichtet. Effizient. Klar.*, 2. Auflage, UVK Verlag, Tübingen

T 7.76 Module component: Experimental Economics (Bachelor) [T-WIWI-115079]

Coordinators: Dr. Hannes Rau
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101499 - Applied Microeconomics

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Once	3

Courses					
ST 2026	2500071	Experimental Economics (Bachelor)	2 SWS	Lecture / 🗣	Rau
ST 2026	2500072	Exercises Experimental Economics (Bachelor)	1 SWS	Practice / 🗣	Rau
Exams					
ST 2026	7900286	Exam Experimental Economis (Bachelor)			Rau
ST 2026	7900293	Exam NT Experimental Economis (Bachelor)			Rau

Legend: 🖥 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment takes the form of an examination of another type (Prüfungsleistung anderer Art). It consists of two components:

1. A **written exam** (60 min.), which is offered on two dates (expected at the end of July and mid-September 2026).
2. A **written assignment** involving the independent design of a study related to a selected published research paper.

The overall grade for the assessment is based on a point system, where the written exam accounts for **70%** and the written assignment for **30%** of the total attainable points. Details regarding the grading process will be announced at the beginning of the course.

Prerequisites
The module [M-WIWI-101398] Introduction to Economics
should have been successfully completed.

Recommendations
Basic knowledge of microeconomic theory, game theory, and statistics is helpful but not required.

Additional Information
The language of the course is German.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Exercises Experimental Economics (Bachelor)

2500072, SS 2026, 1 SWS, Language: German, Open in study portal

Practice (Ü)
On-Site

Content

The aim of this course is to provide an overview of the field of experimental economics and its various applications within economics and related disciplines.

The course begins with an introduction to the fundamental methodology of experimental economics. This includes discussing the possibilities and limitations of economic studies, the rules and principles guiding their implementation, the different types of experiments and their applications for different research purposes.

A central component of the course is the analysis of well-known and influential studies in experimental (and behavioral) economics. The respective study designs and main findings will be presented and subsequently critically discussed. In addition, research questions for potential follow-up projects will be developed.

Furthermore, the course introduces the basics of game-theoretic analysis and data analysis.

By the end of the course, participants should be able to develop their own research ideas and an appropriate experimental study to investigate them.

T 7.77 Module component: Facility Location and Strategic Supply Chain Management [T-WIWI-102704]

Coordinators: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101413 - Applications of Operations Research
M-WIWI-101414 - Methodical Foundations of OR
M-WIWI-101421 - Supply Chain Management

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	4

Exams			
WT 25/26	7900091	Facility Location and Strategic Supply Chain Management	Nickel

Assessment
The assessment consists of a written exam (60 min) according to Section 4 (2), 1 of the examination regulation.
The exam takes place in every semester.
Prerequisite for admission to examination is the succesful completion of the online assessments.

Prerequisites
Prerequisite for admission to examination is the succesful completion of the online assessments.

Recommendations
None

Additional Information
The lecture is held in every winter term. The planned lectures and courses for the next three years are announced online at https://dol.ior.kit.edu/Lehrveranstaltungen.php.

Workload
135 hours

T 7.78 Module component: Failure of Structural Materials: Deformation and Fracture [T-MACH-102140]

Coordinators: Prof. Dr. Peter Gumbsch
Dr. Daniel Weygand

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101262 - Emphasis Materials Science

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each winter term	1

Courses					
WT 25/26	2181711	Failure of structural materials: deformation and fracture	3 SWS	Lecture / Practice / 🗣	Gumbsch, Weygand
Exams					
WT 25/26	76-T-MACH-102140	Failure of Structural Materials: Deformation and Fracture			Weygand, Gumbsch, Kraft

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✗ Cancelled

Assessment
oral exam ca. 30 minutes

no tools or reference materials

Prerequisites
none

Recommendations
preliminary knowlegde in mathematics, mechanics and materials science

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Failure of structural materials: deformation and fracture

Lecture / Practice (VÜ)
On-Site

2181711, WS 25/26, 3 SWS, Language: German, Open in study portal

Content

1. Introduction
2. linear elasticity
3. classification of stresses
4. Failure due to plasticity
    - tensile test
    - dislocations
    - hardening mechanisms
    - guidelines for dimensioning
5. composite materials
6. fracture mechanics
    - hypotheses for failure
    - linear elasic fracture mechanics
    - crack resitance
    - experimental measurement of fracture toughness
    - defect measurement
    - crack propagation
    - application of fracture mechanics
    - atomistics of fracture

The student

- has the basic understanding of mechanical processes to explain the relationship between externally applied load and materials strength.
- can explain the foundation of linear elastic fracture mechanics and is able to determine if this concept can be applied to a failure by fracture.
- can decribe the main empirical materials models for deformation and fracture and can apply them.
- has the physical understanding to describe and explain phenomena of failure.

preliminary knowlegde in mathematics, mechanics and materials science recommended

regular attendance: 22,5 hours
self-study: 97,5 hours

The assessment consists of an oral examination (ca. 30 min) according to Section 4(2), 2 of the examination regulation.

Organizational issues
Übungstermine werden in der Vorlesung bekannt gegeben!

Die Veranstaltung wird letztmals im Wintersemester 2025/2026 angeboten!

Literature

- Engineering Materials, M. Ashby and D.R. Jones (2nd Edition, Butterworth-Heinemann, Oxford, 1998); sehr lesenswert, relativ einfach aber dennoch umfassend, verständlich
- Mechanical Behavior of Materials, Thomas H. Courtney (2nd Edition, McGraw Hill, Singapur); Klassiker zu den mechanischen Eigenschaften der Werkstoffe, umfangreich, gut
- Bruchvorgänge in metallischen Werkstoffen, D. Aurich (Werkstofftechnische Verlagsgesellschaft Karlsruhe), relativ einfach aber dennoch umfassender Überblick für metallische Werkstoffe

T 7.79 Module component: Failure of Structural Materials: Fatigue and Creep [T-MACH-102139]

Coordinators: Dr. Patric Gruber
Prof. Dr. Peter Gumbsch

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101262 - Emphasis Materials Science

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each winter term	1

Courses					
WT 25/26	2181715	Failure of Structural Materials: Fatigue and Creep	2 SWS	Lecture / 🗣	Gruber, Gumbsch
Exams					
WT 25/26	76-T-MACH-102139	Failure of Structural Materials: Fatigue and Creep			Gruber, Gumbsch
ST 2026	76-T-MACH-102139	Failure of Structural Materials: Fatigue and Creep			Gruber, Gumbsch

Legend: 📱 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral exam ca. 30 minutes

no tools or reference materials

Prerequisites
none

Recommendations
preliminary knowlegde in mathematics, mechanics and materials science

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Failure of Structural Materials: Fatigue and Creep

2181715, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
1 Fatigue
1.1 Introduction
1.2 Lifetime
1.3 Fatigue Mechanisms
1.4 Material Selection
1.5 Notches and Shape Optimization
1.6 Case Studies: ICE-Accidents

2 Creep
2.1 Introduction
2.2 High Temperature Plasticity
2.3 Phänomenological DEsciption of Creep
2.4 Creep Mechanisms
2.5 Alloying Effects

The student

- has the basic understanding of mechanical processes to explain the relationships between externally applied load and materials strength.
- can describe the main empirical materials models for fatigue and creep and can apply them.
- has the physical understanding to describe and explain phenomena of failure.
- can use statistical approaches for reliability predictions.
- can use its acquired skills, to select and develop materials for specific applications.

preliminary knowlegde in mathematics, mechanics and materials science recommended

regular attendance: 22,5 hours
self-study: 97,5 hours

The assessment consists of an oral examination (ca. 30 min) according to Section 4(2), 2 of the examination regulation.

Organizational issues
Die Veranstaltung wird letztmals im Wintersemester 2025/2026 angeboten!

Literature

- Engineering Materials, M. Ashby and D.R. Jones (2nd Edition, Butterworth-Heinemann, Oxford, 1998); sehr lesenswert, relativ einfach aber dennoch umfassend, verständlich
- Mechanical Behavior of Materials, Thomas H. Courtney (2nd Edition, McGraw Hill, Singapur); Klassiker zu den mechanischen Eigenschaften der Werkstoffe, umfangreich, gut
- Bruchvorgänge in metallischen Werkstoffen, D. Aurich (Werkstofftechnische Verlagsgesellschaft Karlsruhe), relativ einfach aber dennoch umfassender Überblick für metallische Werkstoffe
- Fatigue of Materials, Subra Suresh (2nd Edition, Cambridge University Press); Standardwerk über Ermüdung, alle Materialklassen, umfangreich, für Einsteiger und Fortgeschrittene

T 7.80 Module component: Fatigue of Materials [T-MACH-112106]

Coordinators: Dr.-Ing. Stefan Guth
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101262 - Emphasis Materials Science

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each summer term	2

Courses					
ST 2026	2173586	Fatigue of Materials	2 SWS	Lecture / 🗣	Guth
Exams					
WT 25/26	76-T-MACH-112106	Fatigue of Materials			Guth
ST 2026	76-T-MACH-112106	Fatigue of Materials			Guth

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Oral exam, about 20 minutes

Prerequisites
none

Recommendations
Basic knowledge in Materials Science will be helpful.

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Fatigue of Materials

2173586, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

- Introduction: historical review and some fatigue damage cases
- Cyclic Stress Strain Behaviour
- Crack Initiation
- Crack Propagation
- Lifetime Behaviour under Cyclic Loading
- Fatigue of Notched Components
- Structural Durability
- Fatigue of composites and compound materials

learning objectives:

The students are able to recognise the deformation and the failure behaviour of materials under cyclic loading and to assign it to the basic microstructural processes. They know the sequence and the development of fatigue damages and can evaluate the initiation and the growth of fatigue cracks.

The students can evaluate the cyclic strength behaviour of materials and components both qualitatively and quantitatively and know the procedures for the assessment of single-stage, multistage and stochastic cyclical loadings.

requirements:

none, basic knowledge in Material Science will be helpful

workload:

regular attendance: 21 hours
self-study: 99 hours

Literature
Ein Manuskript, das auch aktuelle Literaturhinweise enthällt, wird in der Vorlesung verteilt.

T 7.81 Module component: Financial Accounting for Global Firms [T-WIWI-107505]

Coordinators: Dr. Torsten Luedecke
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2530242	Financial Accounting for Global Firms	2 SWS	Lecture / 🗣	Luedecke
WT 25/26	2530243	Übung zu Financial Accounting for Global Firms	1 SWS	Practice / 🗣	Luedecke
Exams					
WT 25/26	7900142	Financial Accounting for Global Firms			Luedecke, Ruckes
ST 2026	7900195	Financial Accounting for Global Firms			Luedecke

Legend: 📱 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Prerequisites
None

Recommendations
Basic knowledge in corporate finance and accounting.

Additional Information
New lecture in the winter term 2017/18.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Financial Accounting for Global Firms

2530242, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Literature

Alexander, D. and C. Nobes (2017): Financial Accounting – An International Introduction, 6th ed., Pearson.

Coenenberg, A.G., Haller, A. und W. Schultze (2016): Jahresabschluss und Jahresabschlussanalyse, 24. Auflage. Schäffer-Poeschel Verlag Stuttgart.

T 7.82 Module component: Financial Data Science [T-WIWI-111238]

Coordinators: Prof. Dr. Maxim Ulrich
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-105610 - Financial Data Science

Type	Credits	Grading	Term offered	Version
Examination of another type	9 CP	graded	Each summer term	2

Courses					
ST 2026	2530371	Financial Data Science	4 SWS	Lecture / 🗣	Ulrich

Legend: 🖥 Online, ⚘ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The examination is structured as an alternative assessment.

Further details regarding submission deadlines, exam format, and retake opportunities will be announced in the first session.

Prerequisites
None.

Workload
270 hours

T 7.83 Module component: Financial Data Science in Practice [T-WIWI-114633]

Coordinators: Prof. Dr. Maxim Ulrich
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-107454 - Financial Data Science in Practice

Type	Credits	Grading	Term offered	Version
Examination of another type	9 CP	graded	Each term	1

Assessment
The examination is structured as an alternative exam assessment and consists of the following components:

- **Interim Presentations (Formative Milestones)**
- **Quality of Implementation** (Reproducibility, Code Documentation, Tests)
- **Final Written Paper** (15 – 20 pages, scientific standard)
- **Final Presentation** (approx. 30 minutes, public research talk)

The overall grade is determined by the weighted evaluation of the individual components of this assessment. The exact weighting of these components for grade calculation will be announced at the beginning of the course.

Prerequisites
The course T-WIWI-111238 "Financial Data Science" must be passed.

Workload
270 hours

T 7.84 Module component: Financial Econometrics [T-WIWI-103064]

Coordinators: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101599 - Statistics and Econometrics
M-WIWI-105414 - Statistics and Econometrics II

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	2

Courses					
WT 25/26	2520022	Financial Econometrics I	2 SWS	Lecture / 🗣	Schienle
WT 25/26	2520023	Übungen zu Financial Econometrics I	2 SWS	Practice / 🗣	Buse
Exams					
WT 25/26	7900126	Financial Econometrics			Schienle
ST 2026	7900223	Financial Econometrics			Schienle

Legend: 🖥 Online, ♻ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites
None

Recommendations
It is recommended that students have substantive knowledge of the course “Economics III: Introduction to Econometrics”.

Additional Information
The course will be held in English.

Below you will find excerpts from courses related to this module component:

V Financial Econometrics I

2520022, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
Learning objectives:

The student

- shows a broad knowledge of fincancial econometric estimation and testing techniques
- is able to apply his/her technical knowledge using software in order to critically assess empirical problems

Content:

ARMA, ARIMA, ARFIMA, (non)stationarity, causality, cointegration, ARCH/GARCH, stochastic volatility models, computer based exercises

Requirements:

It is recommended to attend the course *Economics III: Introduction to Econometrics* [2520016] prior to this course.

Workload:

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

Exam preparation: 40 hours

Literature

Taylor, S. J. (2005): "Asset Price Dynamics, Volatility, and Prediction", Princeton University Press.

Tsay, R. S. (2005): "Analysis of Financial Time Series: Financial Econometrics", Wiley, 2nd edition.

Cochrane, J. H. (2005): "Asset Pricing", revised edition, Princeton University Press.

Campbell, J. Y., A. W. Lo, and A. C. MacKinlay (1997): "The Econometrics of Financial Markets", Princeton University Press.

Hamilton, J. D. (1994): "Time Series Analysis", Princeton University Press.

Additional literature will be discussed in the lecture.

T 7.85 Module component: Financial Econometrics II [T-WIWI-110939]

Coordinators: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101599 - Statistics and Econometrics
M-WIWI-105414 - Statistics and Econometrics II

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	3

Courses					
ST 2026	2521302	Financial Econometrics II	2 SWS	Lecture / 🗣	Schienle, Buse
ST 2026	2521303	Übung zu Financial Econometrics II	2 SWS	Practice / 🗣	Buse, Schienle
Exams					
ST 2026	7900081	Financial Econometrics II			Schienle

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written examination (90 minutes). If the number of participants is low, an oral examination will be held instead.

Prerequisites
None

Recommendations
It is recommended that students have substantive knowledge of the course **"Financial Econometrics."**

Additional Information
The course will be held in English.

Workload
135 hours

T 7.86 Module component: Financial Intermediation [T-WIWI-102623]

Coordinators: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2530232	Financial Intermediation	2 SWS	Lecture / 🗣	Ruckes
WT 25/26	2530233	Übung zu Finanzintermediation	1 SWS	Practice	Ruckes, Benz
Exams					
WT 25/26	7900063	Financial Intermediation			Ruckes
ST 2026	7900078	Financial Intermediation			Ruckes

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment of this course is a written examination (following §4(2), 1 SPO) of 60 mins.

The exam is offered each semester.

Prerequisites
None

Recommendations
None

Below you will find excerpts from courses related to this module component:

V Financial Intermediation

2530232, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Organizational issues
Terminankündigungen des Instituts beachten

Literature
Weiterführende Literatur:

- Hartmann-Wendels/Pfingsten/Weber (2014): Bankbetriebslehre, 6. Auflage, Springer Verlag.
- Freixas/Rochet (2008): Microeconomics of Banking, 2. Auflage, MIT Press.

T 7.87 Module component: Financial Management [T-WIWI-102605]

Coordinators: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101435 - Essentials of Finance

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	1

Courses					
ST 2026	2530216	Financial Management	2 SWS	Lecture / 🗣	Ruckes
ST 2026	2530217	Übung zu Financial Management	1 SWS	Practice / 🗣	Ruckes
Exams					
WT 25/26	7900060	Financial Management			Ruckes
ST 2026	7900074	Financial Management			Ruckes

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (60 min.) according to Section 4 (2), 1 of the examination regulation.
The exam takes place at every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Recommendations
Knowledge of the content of the course Business Administration: Finance and Accounting [25026/25027] is recommended.

Below you will find excerpts from courses related to this module component:

V Financial Management

2530216, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Literature
Weiterführende Literatur:

- Ross, Westerfield, Jaffe, Jordan (2009): Modern Financial Management, McGraw-Hill International Edition
- Berk, De Marzo (2016): Corporate Finance, 4. Edition, Pearson Addison Wesley

T 7.88 Module component: FinTech [T-WIWI-112694]

Coordinators: Prof. Dr. Julian Thimme
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101402 - eFinance
M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2500032	FinTech	2 SWS	Lecture / On-Site	Thimme
WT 25/26	2500219	FinTech (Exercice)	1 SWS	Practice / On-Site	Meng, Thimme
Exams					
WT 25/26	7900064	FinTech			Thimme
ST 2026	7900089	FinTech			Thimme

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Written examination (90 minutes) during the lecture-free period of the semester (according to §4(2), 1 SPO).

The examination is offered every semester and can be repeated at any regular examination date.

Prerequisites
None

Recommendations
Knowledge of the course Business Administration: Finance and Accounting [25026/25027] is very helpful.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V FinTech

2500032, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
Banks and other financial institutions are central entities that are crucial to the way capital markets are organized today. They have a variety of tasks: They lend to business and retail customers, thereby creating money, accept deposits, transfer money, advise customers, help companies issue stock, and much more. While all of these services are important for the smooth allocation of capital in an economy, recent technological advances allow companies called FinTechs to challenge banks' traditional business models. While FinTechs are still centralized entities, decentralized innovations based on blockchain technologies have the potential to fundamentally upend the system.

We start with a discussion of the problems with capital allocation and what financial institutions are doing to address these problems. The key question we are interested in is how efficient alternative solutions offered by traditional banks, FinTechs and Decentralized Finance applications are compared to each other. What are the advantages and disadvantages of the new technologies and how likely are they to prevail? In the different parts of the course, we will explore specific examples, including the status quo and possible ways forward.

T 7.89 Module component: Foundations of Informatics I [T-WIWI-102749]

Coordinators: Dr.-Ing. Tobias Käfer
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101417 - Foundations of Informatics

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each summer term	2

Courses					
ST 2026	2511010	Foundations of Informatics I	2 SWS	Lecture / 🗣	Käfer
ST 2026	2511011	Exercises to Foundations of Informatics I		Practice / 🗣	Käfer, Noullet, Kinder
Exams					
WT 25/26	79AIFB_Info1_A5	Foundations of Informatics I (Registration extended until Feb 16 – Late registration: Waitlist only, seat not guaranteed)			Käfer
ST 2026	791-AIFB-Info1-HK	Foundations of Informatics I (Registration until 20 July 2026)			Käfer

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of an 1h written exam according to Section 4 (2), 1 of the examination regulation.

The exam takes place every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Below you will find excerpts from courses related to this module component:

V Foundations of Informatics I
2511010, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The lecture provides an introduction to basic concepts of computer science and software engineering. Essential theoretical foundations and problem-solving approaches, which are relevant in all areas of computer science, are presented and explained, as well as shown in practical implementations.

The following topics are covered:

- Object Oriented Modeling
- Logic (Propositional Calculus, Predicate Logic, Boolean Algebra)
- Algorithms and Their Properties
- Sort-and Search-Algorithms
- Complexity Theory
- Problem Specification
- Dynamic Data Structures

Learning objectives:

The student

- is able to formalise tasks in the domain of informatics and is able to identify solution methods
- knows the basic terminology of computer science and is capable of applying these terms to different problems.
- knows basic programming structures and is able to apply them (particularly simple data structures, object interaction and implementation of basic algorithms).

Workload:

- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preperation and postprocessing: 67.5 hours
- Exam and exam preperation: 37.5 hours

Literature

- H. Balzert. Lehrbuch Grundlagen der Informatik. Spektrum Akademischer Verlag 2004.
- U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag 2000.
- T. H. Cormen, C. E. Leiserson. Introduction to Algorithms, MIT Press 2001.

V	**Exercises to Foundations of Informatics I** 2511011, SS 2026, SWS, Language: German, Open in study portal	**Practice (Ü)** **On-Site**

Content

The exercises are related to the lecture Foundations of Informatics I.

Multiple exercises are held that capture the topics, held in the lecture Foundations of Informatics I, and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

The following topics are covered:

- Object Oriented Modeling
- Logic (Propositional Calculus, Predicate Logic, Boolean Algebra)
- Algorithms and Their Properties
- Sort-and Search-Algorithms
- Complexity Theory
- Problem Specification
- Dynamic Data Structures

Learning objectives:

The student

- is able to formalise tasks in the domain of informatics and is able to identify solution methods
- knows the basic terminology of computer science and is capable of applying these terms to different problems.
- knows basic programming structures and is able to apply them (particularly simple data structures, object interaction and implementation of basic algorithms).

Literature

- H. Balzert. Lehrbuch Grundlagen der Informatik. Spektrum Akademischer Verlag 2004.
- U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag 2000.
- T. H. Cormen, C. E. Leiserson. Introduction to Algorithms, MIT Press 2001.

T 7.90 Module component: Foundations of Informatics II [T-WIWI-102707]

Coordinators: Prof. Dr.-Ing. Sanja Lazarova-Molnar
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101417 - Foundations of Informatics

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each winter term	1

Courses					
WT 25/26	2511012	Foundations of Informatics II	3 SWS	Lecture / 🗣	Lazarova-Molnar
WT 25/26	2511013	Tutorien zu Grundlagen der Informatik II	1 SWS	Tutorial / 🗣	Lazarova-Molnar, Jungmann, Deufel
Exams					
WT 25/26	79AIFB_Info2_Deutsch	Foundations of Informatics II (exam in German, Registration extended until Feb 16 – Late registration: Waitlist only, seat not guaranteed)			Lazarova-Molnar
WT 25/26	79AIFB_Info2_English	Grundlagen der Informatik II (englischsprachige Klausur, Anmeldefrist verlängert bis 16.02. – Nachmeldung nur auf Warteliste ohne Platzgarantie))			Lazarova-Molnar
ST 2026	791-AIFB-Info2-dt-NK	Foundations of Informatics II (written exam in German, registration until 20 July 2026)			Lazarova-Molnar
ST 2026	791-AIFB-Info2-en-NK	Grundlagen der Informatik II (englischsprachige Klausur, Anmeldung bis 20.07.2026)			Lazarova-Molnar

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment takes the form of a written examination (in accordance with §4(2), 1 SPO), which can be completed in either German or English. The examination is offered every semester and can be retaken at any regular examination date.

The duration of the examination is 90 minutes.

Prerequisites
None

Recommendations
It is recommended to attend the course "Foundations of Informatics I" beforehand.

Active participation in the practical lessons is strongly recommended.

Below you will find excerpts from courses related to this module component:

V Foundations of Informatics II
2511012, WS 25/26, 3 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content

The course deals with formal models like finite automata, context-free grammars and push-down automata, offers formal descriptions of computational models of different complexity, and classifies language systems according to their expressive power; it investigates the limits of computability and theoretical complexity to distinguish efficiently solvable problems (P) from computationally intensive ones (NP-complete); at the same time it conveys the fundamentals of computer organization, including digital information formats (integer and floating-point), symbolic logic and the design of functional circuit components, followed by explanations of basic computer architectures, their instruction logic and the standardized fetch-decode-execute cycle, hierarchical storage concepts (cache levels, secondary memory), input-/output mechanisms, redundancy strategies, as well as methods for objective performance assessment and systematic optimization.

Learning objectives:

- Students acquire vast knowledge of methods and concepts in theoretical computer science and computer architectures.
- Based on the acquired knowledge and skills, students are capable of choosing and applying the appropriate methods and concepts for well-defined problem instances.
- Active participation in the tutorials enables students to acquire the necessary knowledge for developing appropriate solutions cooperatively.

Recommendations:

It is recommended to attend the course *Foundations of Informatics I* [2511010] beforehand.

Active participation in the practical lessons is strongly recommended.

Workload:

- Total workload for 5 credit points: approx. 150 hours
- Attendance time – Lecture: 30 h
- Attendance time – Tutorial: 15 h
- Preparation and follow-up: 67.5 hours
- Examination and exam preparation: 37.5 hours

Organizational issues

Die Vorlesung wird zu Beginn des Semesters 4-stündig und am Ende 2-stündig gelesen, um eine bessere Abdeckung des Inhalts in den Übungen zu gewährleisten.

Literature

Weiterführende Literatur:

Literatur wird in der Vorlesung bekannt gegeben.

T 7.91 Module component: Foundations of Interactive Systems [T-WIWI-109816]

Coordinators: Prof. Dr. Alexander Mädche
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101434 - eBusiness and Service Management
M-WIWI-102752 - Fundamentals of Digital Service Systems
M-WIWI-105928 - HR Management & Digital Workplace
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each summer term	3

Courses					
ST 2026	2540560	Foundations of Interactive Systems	3 SWS	Lecture / Blended	Mädche, Feick
Exams					
WT 25/26	7900326	Foundations of Interactive Systems			Mädche
ST 2026	7900247	Foundations of Interactive Systems			Mädche

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Alternative exam assessment. The assessment is carried out in the form of a one-hour written examination and by carrying out a Capstone project.

Details on the assessment will be announced during the lecture.

Prerequisites
None

Recommendations
None

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V **Foundations of Interactive Systems** — **Lecture (V)** **Blended (On-Site/Online)**
2540560, SS 2026, 3 SWS, Language: English, Open in study portal

Content

Lecture Description

Computers have evolved from batch processors to highly interactive systems. This offers new possibilities besides challenges for designing a successful interaction between humans and computers. Interactive systems are socio-technical systems in which users perform tasks by interacting with technology in a specific context to achieve specified goals and outcomes.

This lecture introduces key concepts and principles of interactive systems from a human and computer perspective. From a human perspective, we discuss selected individual characteristics, cognitive processes, the interplay between cognition and activity, as well asmental models. From a computer perspective, we introduce established interaction technologies as well as contemporary multimodal technologies (e.g. augmented/mixed reality, eye-based interaction, etc.). We also introduce established principles and guidelines for designing user interfaces.. Furthermore, we describe the human-centered design process for interactive systems and supporting techniques & tools (e.g. personas, prototyping, user testing).

With this lecture, students acquire foundational knowledge to successfully **design the interaction between humans and computers** in business and private life. The course is complemented with a **Design Capstone Project**, where students in a team apply design methods & techniques to create an interactive prototype.

Learning Objectives

The students

- have a basic understanding of key conceptual and theoretical foundations of interactive systems from a human and computer perspective
- are aware of important design principles for the design of important classes of interactive systems
- know design processes and techniques for developing interactive systems
- know how to apply the knowledge and skills gathered in the lecture for a real-world problem (as part of design capstone project)

Prerequisites: No specific prerequisites are required for the lecture

Language of instruction: English

Bibliography

Alan Dix, Janet E. Finlay, Gregory D. Abowd, and Russell Beale. 2003. Human-Computer Interaction (3rd Edition). Prentice-Hall, Inc., USA.

Further literature will be made available in the lecture. In case of questions feel free to approach Siu Liu (siu.liu@kit.edu).

Die Erfolgskontrolle erfolgt in Form einer Prüfungsleistung anderer Art (Form) nach § 4 Abs. 2 Nr. 3 SPO. Die Leistungskontrolle erfolgt in Form einer einstündigen Klausur und der Durchführung eines Capstone Projektes. Details zur Ausgestaltung der Erfolgskontrolle werden im Rahmen der Vorlesung bekannt gegeben.

T 7.92 Module component: Fuels and Lubricants for Combustion Engines [T-MACH-105184]

Coordinators: Hon.-Prof. Dr. Bernhard Ulrich Kehrwald
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101303 - Combustion Engines II

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each winter term	1

Courses					
WT 25/26	2133108	Fuels and Lubricants for Combustion Engines	2 SWS	Lecture / 🗣	Kehrwald
Exams					
WT 25/26	76-T-MACH-105184	Fuels and Lubricants for Combustion Engines			Kehrwald
ST 2026	76-T-MACH-105184	Fuels and Lubricants for Combustion Engines			Kehrwald

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral examination, Duration: ca. 25 min., no auxiliary means

Prerequisites
none

Additional Information
The course is offered in German.

Below you will find excerpts from courses related to this module component:

V Fuels and Lubricants for Combustion Engines

2133108, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Literature
Skript

T 7.93 Module component: Functional Ceramics [T-MACH-105179]

Coordinators: Dr. Miriam Botros
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101262 - Emphasis Materials Science

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each winter term	2

Courses					
WT 25/26	2126784	Functional Ceramics	2 SWS	Lecture /	Botros
Exams					
WT 25/26	76-T-MACH-105179	Functional Ceramics			Botros
ST 2026	76-T-MACH-105179	Functional Ceramics			Botros

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
The assessment consists of an oral exam (20 min) taking place at the agreed date.

Auxiliary means: none

The re-examination is offered upon agreement.

Prerequisites
T-MACH-114752 – Functional Ceramics must not be started yet.

Additional Information
The course is offered in German.

Workload
120 hours

T 7.94 Module component: Fundamentals for Design of Motor-Vehicle Bodies I [T-MACH-102116]

Coordinators: Dipl.-Ing. Horst Dietmar Bardehle
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Automotive Engineering

Type	Credits	Grading	Term offered	Version
Oral examination	1,5 CP	graded	Each winter term	2

Courses					
WT 25/26	2113814	Fundamentals for Design of Motor-Vehicles Bodies I	1 SWS	Lecture / 🗣	Knoch
Exams					
WT 25/26	76-T-MACH-102116	Fundamentals for Design of Motor-Vehicle Bodies I			Knoch

Legend: 📱 Online, 🔄 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral examination

Duration: approx. 30 minutes

Auxiliary means: none

Prerequisites
none

Additional Information
The course is offered in German.

Workload
60 hours

Below you will find excerpts from courses related to this module component:

V Fundamentals for Design of Motor-Vehicles Bodies I

2113814, WS 25/26, 1 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
1. History and design

2. Aerodynamics

3. Design methods (CAD/CAM, FEM)

4. Manufacturing methods of body parts

5. Fastening technologie

6. Body in white / body production, body surface

Learning Objectives:

The students have an overview of the fundamental possibilities for design and manufacture of motor-vehicle bodies. They know the complete process, from the first idea, through the concept to the dimensioned drawings (e.g. with FE-methods). They have knowledge about the fundamentals and their correlations, to be able to analyze and to judge relating components as well as to develop them accordingly.

Organizational issues

Das Vorlesungsmaterial wird auf ILIAS bereitgestellt. Das ILIAS-Passwort erhalten Sie unter https://fast-web-01.fast.kit.edu/PasswoerterIlias/

Termine und nähere Informationen: siehe ILIAS oder Institutshomepage

Dates and further information will be published on the homepage of the institute

Literature

1. Automobiltechnische Zeitschrift ATZ, Friedr. Vieweg & Sohn Verlagsges. mbH, Wiesbaden
2. Automobil Revue, Bern (Schweiz)
3. Automobil Produktion, Verlag Moderne Industrie, Landsberg

T 7.95 Module component: Fundamentals for Design of Motor-Vehicle Bodies II [T-MACH-102119]

Coordinators: Dipl.-Ing. Horst Dietmar Bardehle
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Automotive Engineering

Type	Credits	Grading	Term offered	Version
Oral examination	1,5 CP	graded	Each summer term	1

Exams			
WT 25/26	76-T-MACH-102119	Fundamentals for Design of Motor-Vehicle Bodies II	Knoch

Assessment
Oral examination

Duration: approx. 30 minutes

Auxiliary means: none

Prerequisites
none

Additional Information
The course is offered in German.

Workload
60 hours

T 7.96 Module component: Fundamentals in the Development of Commercial Vehicles [T-MACH-111389]

Coordinators: Christof Weber
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101265 - Vehicle Development
M-MACH-101267 - Mobile Machines

Type	Credits	Grading	Term offered	Version
Oral examination	3 CP	graded	see Annotations	2

Courses					
WT 25/26	2113812	Fundamentals in the Development of Commercial Vehicles I	1 SWS	Lecture / 🗣	Weber
ST 2026	2114844	Fundamentals in the Development of Commercial Vehicles II	1 SWS	Lecture / 🗣	Weber
Exams					
WT 25/26	76-T-MACH-111389	Fundamentals in the Development of Commercial Vehicles			Weber
ST 2026	76-T-MACH-111389	Fundamentals in the Development of Commercial Vehicles			Weber

Legend: 🖥 Online, ♻ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral group examination

Duration: appr. 30 minutes

Auxiliary means: none

Prerequisites
none

Additional Information
Fundamentals in the Development of Commercial Vehicles I, WT

Fundamentals in the Development of Commercial Vehicles II, ST

The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Fundamentals in the Development of Commercial Vehicles I

Lecture (V)
On-Site

2113812, WS 25/26, 1 SWS, Language: German, Open in study portal

Content

1. Introduction, definitions, history
2. Development tools
3. Complete vehicle
4. Cab, bodyshell work
5. Cab, interior fitting
6. Alternative drive systems
7. Drive train
8. Drive system diesel engine
9. Intercooled diesel engines

Learning Objectives:

The students have proper knowledge about the process of commercial vehicle development starting from the concept and the underlying original idea to the real design. They know that the customer requirements, the technical realisability, the functionality and the economy are important drivers.

The students are able to develop parts and components. Furthermore they have knowledge about different cab concepts, the interior and the interior design process. Consequently they are ready to analyze and to judge concepts of commercial vehicles as well as to participate competently in the commercial vehicle development.

Organizational issues

Das Vorlesungsmaterial wird auf ILIAS bereitgestellt. Das ILIAS-Passwort erhalten Sie unter https://fast-web-01.fast.kit.edu/PasswoerterIlias/

Termine und Nähere Informationen: siehe ILIAS oder Institutshomepage

Dates and further information will be published on the homepage of the institute.

Literature

1. Marwitz, H., Zittel, S.: ACTROS -- die neue schwere Lastwagenbaureihe von Mercedes-Benz, ATZ 98, 1996, Nr. 9

2. Alber, P., McKellip, S.: ACTROS -- Optimierte passive Sicherheit, ATZ 98, 1996

3. Morschheuser, K.: Airbag im Rahmenfahrzeug, ATZ 97, 1995, S. 450 ff.

V **Fundamentals in the Development of Commercial Vehicles II** **Lecture (V) On-Site**
2114844, SS 2026, 1 SWS, Language: German, Open in study portal

Content

1. Gear boxes of commercial vehicles
2. Intermediate elements of the drive train
3. Axle systems
4. Front axles and driving dynamics
5. Chassis and axle suspension
6. Braking System
7. Systems
8. Excursion

Learning Objectives:

The students know the advantages and disadvantages of different drives. Furthermore they are familiar with components, such as transfer box, propeller shaft, powered and non-powered frontaxle etc. Beside other mechanical components, such as chassis, axle suspension and braking system, also electric and electronic systems are known. Consequently the student are able to analyze and to judge the general concepts as well as to adjust them precisely with the area of application.

Organizational issues

die Vorlesung findet an unregelmäßigen Terminen am Campus Ost statt. Genaue Termine sowie nähere Informationen und eventuelle Terminänderungen:

siehe Institutshomepage.

Literature

1.HILGERS, M.: Nutzfahrzeugtechnik lernen, Springer Vieweg, ISSN: 2510-1803

2.SCHITTLER, M.; HEINRICH, R.; KERSCHBAUM, W.: Mercedes-Benz Baureihe 500 – neue V-Motorengeneration für schwere Nutzfahrzeuge, MTZ 57 Nr. 9, S. 460 ff, 1996

3.Robert Bosch GmbH (Hrsg.): Bremsanalgen für Kraftfahrzeuge, VDI-Verlag, Düsseldorf, 1. Auflage, 1994

4.RUBI, V.; STRIFLER, P. (Hrsg. Institut für Kraftfahrwesen RWTH Aachen): Indiustrielle Nutzfahrzeugentwicklung, Schriftenreihe Automobiltechnik, 1993

5.TEUTSCH, R.; CHERUTI, R.; GASSER, R.; PEREIRA, M.; de SOUZA, A.; WEBER, C.: Fuel Efficiency Optimization of Market Specific Truck Applications, Proceedings of the 5th Commercial Vehicle Technology Symposium – CVT 2018

T 7.97 Module component: Fundamentals of Catalytic Exhaust Gas Aftertreatment [T-MACH-105044]

Coordinators: Prof. Dr. Olaf Deutschmann
Prof. Dr. Jan-Dierk Grunwaldt
Dr.-Ing. Heiko Kubach
Hon.-Prof. Dr. Egbert Lox

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101303 - Combustion Engines II

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each summer term	1

Courses					
ST 2026	2134138	Fundamentals of catalytic exhaust gas aftertreatment	2 SWS	Lecture / 🗣	Lox, Grunwaldt, Deutschmann
Exams					
ST 2026	76-T-MACH-105044	Fundamentals of Catalytic Exhaust Gas Aftertreatment			Lox

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral examination, Duration approx. 25 min., no auxiliary means

Prerequisites
none

Additional Information
The course is offered in German

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Fundamentals of catalytic exhaust gas aftertreatment

Lecture (V)
On-Site

2134138, SS 2026, 2 SWS, Language: German, Open in study portal

Organizational issues
Wenn Sie beabsichtigen, an der Vorlesung teilzunehmen, melden Sie sich bitte unter info@ifkm.kit.edu mit dem Betreff "Anmeldung Vorlesung Lox" an. Das hilft uns bei der Planung. Der Dozent hat eine sehr weite Anreise und wir möchten verhindern, dass die Mindestteilnehmerzahl nicht erreicht wird.

T 7.98 Module component: Fundamentals of Chemical Engineering [T-CIWVT-114347]

Coordinators: Prof. Dr.-Ing. Gregor Wehinger
Organisation: KIT Department of Chemical and Process Engineering
Part of: M-WIWI-101839 - Additional Fundamentals of Engineering

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each winter term	1

Courses					
WT 25/26	2200310	Introduction to Chemical Engineering	2 SWS	Lecture / 🗣	Dittler, Grünberger, Holtmann, Meurer, Sauer, Scheiff, Stein, Wehinger, Zeiner
Exams					
WT 25/26	7200310	Fundamentals of Chemical Engineering			Wehinger
ST 2026	7200310	Introduction to Chemical Engineering			Wehinger

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✗ Cancelled

Assessment
Learning control is a wirtten exam lastin 90 minutes.

Prerequisites
None

T 7.99 Module component: Fundamentals of Production Management [T-WIWI-102606]

Coordinators: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101437 - Industrial Production I

Type	Credits	Grading	Term offered	Version
Written examination	5,5 CP	graded	Each summer term	1

Courses					
ST 2026	2581950	Fundamentals of Production Management	2 SWS	Lecture / 🗣	Schultmann
ST 2026	2581951	Übungen Grundlagen der Produktionswirtschaft	2 SWS	Practice / 🗣	Frank, Fuhg
Exams					
WT 25/26	7981950	Fundamentals of Production Management			Schultmann
ST 2026	7981950	Fundamentals of Production Management			Schultmann

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, × Cancelled

Assessment
The assessment consists of a written exam (90 minutes) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Below you will find excerpts from courses related to this module component:

V Fundamentals of Production Management
2581950, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
This lecture focuses on strategic production management with respect to various economic aspects. Interdisciplinary approaches of systems theory will be used to describe the challenges of industrial production. This course will emphasize the importance of R&D as the central step in strategic corporate planning to ensure future long-term success. In the field of site selection and planning for firms and factories, attention will be drawn upon individual aspects of existing and greenfield sites as well as existing distribution and supply centres. Students will obtain knowledge in solving internal and external transport and storage problems.

Organizational issues
Blockveranstaltung, siehe Institutsaushang

Literature
Wird in der Veranstaltung bekannt gegeben.

T 7.100 Module component: Gear Cutting Technology [T-MACH-102148]

Coordinators: Hon.-Prof. Dr. Markus Klaiber
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101265 - Vehicle Development
M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each winter term	1

Courses					
WT 25/26	2149655	Gear Technology	2 SWS	Lecture / 🗣	Klaiber
Exams					
WT 25/26	76-T-MACH-102148	Gear Technology			Klaiber

Legend: 🖥 Online, ♲ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral Exam (20 min)

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Gear Technology

2149655, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

Based on the gearing theory, manufacturing processes and machine technologies for producing gearings, the needs of modern gear manufacturing will be discussed in the lecture. For this purpose, various processes for various gear types are taught which represent the state of the art in practice today. A classification in soft and hard machining and furthermore in cutting and non-cutting technologies will be made. For comprehensive understanding the processes, machine technologies, tools and applications of the manufacturing of gearings will be introduced and the current developments presented. For assessment and classification of the applications and the performance of the technologies, the methods of mass production and manufacturing defects will be discussed. Sample parts, reports from current developments in the field of research and an excursion to a gear manufacturing company round out the lecture.

Learning Outcomes:

The students ...

- can describe the basic terms of gearings and are able to explain the imparted basics of the gearwheel and gearing theory.
- are able to specify the different manufacturing processes and machine technologies for producing gearings. Furthermore they are able to explain the functional principles and the dis-/advantages of these manufacturing processes.
- can apply the basics of the gearing theory and manufacturing processes on new problems.
- are able to read and interpret measuring records for gearings. are able to make an appropriate selection of a process based on a given application
- can describe the entire process chain for the production of toothed components and their respective influence on the resulting workpiece properties.

Workload:

regular attendance: 21 hours
self-study: 99 hours

Literature

Medien:

Skript zur Veranstaltung wird über (https://ilias.studium.kit.edu/) bereitgestellt.

Media:

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/).

T 7.101 Module component: Geological Hazards and Risk [T-PHYS-103525]

Coordinators: Dr. Andreas Schäfer
Organisation: KIT Department of Physics
Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Term offered	Version
Examination of another type	8 CP	graded	Each winter term	2

Courses					
WT 25/26	4060121	Geological Hazards and Risk	2 SWS	Lecture / 🗣	Schäfer, Rietbrock
WT 25/26	4060122	Exercises on Geological Hazards and Risk	2 SWS	Practice / 🗣	Schäfer, Rietbrock
Exams					
WT 25/26	7800114	Geological Hazards and Risk			Rietbrock

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Workload
240 hours

T 7.102 Module component: Global Optimization I [T-WIWI-102726]

Coordinators: Prof. Dr. Oliver Stein
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101413 - Applications of Operations Research
M-WIWI-101414 - Methodical Foundations of OR

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	1

Courses					
ST 2026	2550134	Global Optimization I	2 SWS	Lecture / 🗣	Stein
Exams					
WT 25/26	7900004_WS2526_NK	Global Optimization I			Stein
ST 2026	7900205_SS2026_HK	Global Optimization I			Stein

Legend: 🖥 Online, ⚄ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Success is in the form of a written examination in English (60 min.) (according to § 4(2), 1 SPO). The successful completion of the exercises is required for admission to the written exam.

The exam is offered in the lecture of semester and the following semester.

The success check can be done also with the success control for "Global optimization II". In this case, the duration of the written exam is 120 min.

Prerequisites
None

Recommendations
None

Additional Information
Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from courses related to this module component:

V Global Optimization I

2550134, SS 2026, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
In many optimization problems from economics, engineering and natural sciences, solution algorithms are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.

The lecture treats methods for global optimization of convex functions under convex constraints. It is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- Optimality in convex optimization
- Duality, bounds, and constraint qualifications
- Algorithms (Kelley's cutting plane method, Frank-Wolfe method, primal-dual interior point methods)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of *nonconvex* optimization problems forms the contents of the lecture "Global Optimization II". The lectures "Global Optimization I" and "Global Optimization II" are held consecutively *in the same semester*.

Learning objectives:

The student

- knows and understands the fundamentals of deterministic global optimization in the convex case,
- is able to choose, design and apply modern techniques of deterministic global optimization in the convex case in practice.

Literature
O. Stein, Basic Concepts of Global Optimization, Springer, 2024

Weiterführende Literatur:

- W. Alt, Numerische Verfahren der konvexen, nichtglatten Optimierung, Teubner, 2004
- C.A. Floudas, Deterministic Global Optimization, Kluwer, 2000
- R. Horst, H. Tuy, Global Optimization, Springer, 1996
- A. Neumaier, Interval Methods for Systems of Equations, Cambridge University Press, 1990

T 7.103 Module component: Global Optimization I and II [T-WIWI-103638]

Coordinators: Prof. Dr. Oliver Stein
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101414 - Methodical Foundations of OR

Type	Credits	Grading	Term offered	Version
Written examination	9 CP	graded	Each summer term	1

Courses					
ST 2026	2550134	Global Optimization I	2 SWS	Lecture / 🗣	Stein
ST 2026	2550135	Exercise to Global Optimization I	1 SWS	Practice / 🗣	Stein, Beck
ST 2026	2550136	Global Optimization II	2 SWS	Lecture / 🗣	Stein
Exams					
WT 25/26	7900006_WS2526_NK	Global Optimization I and II			Stein
ST 2026	7900207_SS2026_HK	Global Optimization I and II			Stein

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment of the lecture is a written examination in English (120 minutes) according to §4(2), 1 of the examination regulation. The successful completion of the exercises is required for admission to the written exam.

The examination is held in the semester of the lecture and in the following semester.

Prerequisites
None

Recommendations
None

Additional Information
Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from courses related to this module component:

V Global Optimization I

2550134, SS 2026, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content

In many optimization problems from economics, engineering and natural sciences, solution algorithms are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.

The lecture treats methods for global optimization of convex functions under convex constraints. It is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- Optimality in convex optimization
- Duality, bounds, and constraint qualifications
- Algorithms (Kelley's cutting plane method, Frank-Wolfe method, primal-dual interior point methods)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of *nonconvex* optimization problems forms the contents of the lecture "Global Optimization II". The lectures "Global Optimization I" and "Global Optimization II" are held consecutively *in the same semester*.

Learning objectives:

The student

- knows and understands the fundamentals of deterministic global optimization in the convex case,
- is able to choose, design and apply modern techniques of deterministic global optimization in the convex case in practice.

Literature

O. Stein, Basic Concepts of Global Optimization, Springer, 2024

Weiterführende Literatur:

- W. Alt, Numerische Verfahren der konvexen, nichtglatten Optimierung, Teubner, 2004
- C.A. Floudas, Deterministic Global Optimization, Kluwer, 2000
- R. Horst, H. Tuy, Global Optimization, Springer, 1996
- A. Neumaier, Interval Methods for Systems of Equations, Cambridge University Press, 1990

V **Global Optimization II**

2550136, SS 2026, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content

In many optimization problems from economics, engineering and natural sciences, solution algorithms are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.

The lecture treats methods for global optimization of nonconvex functions under nonconvex constraints. It is structured as follows:

- Introduction and examples
- Convex relaxation
- Interval arithmetic
- Convex relaxation via alphaBB method
- Branch-and-bound methods
- Lipschitz optimization

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of *convex* optimization problems forms the contents of the lecture "Global Optimization I". The lectures "Global Optimization I" and "Global Optimization II" are held consecutively *in the same semester*.

Learning objectives:

The student

- knows and understands the fundamentals of deterministic global optimization in the nonconvex case,
- is able to choose, design and apply modern techniques of deterministic global optimization in the nonconvex case in practice.

Literature

O. Stein, Basic Concepts of Global Optimization, Springer, 2024

Weiterführende Literatur:

- W. Alt, Numerische Verfahren der konvexen, nichtglatten Optimierung, Teubner, 2004
- C.A. Floudas, Deterministic Global Optimization, Kluwer, 2000
- R. Horst, H. Tuy, Global Optimization, Springer, 1996
- A. Neumaier, Interval Methods for Systems of Equations, Cambridge University Press, 1990

T 7.104 Module component: Global Optimization II [T-WIWI-102727]

Coordinators: Prof. Dr. Oliver Stein
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101414 - Methodical Foundations of OR

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	2

Courses					
ST 2026	2550136	Global Optimization II	2 SWS	Lecture / 🗣	Stein
ST 2026	2550137	Exercise to Global Optimization II	1 SWS	Practice / 🗣	Stein, Beck
Exams					
WT 25/26	7900005_WS2526_NK	Global Optimization II			Stein
ST 2026	7900206_SS2026_HK	Global Optimization II			Stein

Legend: 🖥 Online, ♻ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment of the lecture is a written examination in English (60 minutes) according to §4(2), 1 of the examination regulation. The successful completion of the exercises is required for admission to the written exam.

The examination is held in the semester of the lecture and in the following semester.

The examination can also be combined with the examination of "Global optimization I". In this case, the duration of the written examination takes 120 minutes.

Prerequisites
None

Additional Information
Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from courses related to this module component:

V Global Optimization II

2550136, SS 2026, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content

In many optimization problems from economics, engineering and natural sciences, solution algorithms are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.

The lecture treats methods for global optimization of nonconvex functions under nonconvex constraints. It is structured as follows:

- Introduction and examples
- Convex relaxation
- Interval arithmetic
- Convex relaxation via alphaBB method
- Branch-and-bound methods
- Lipschitz optimization

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of *convex* optimization problems forms the contents of the lecture "Global Optimization I". The lectures "Global Optimization I" and "Global Optimization II" are held consecutively *in the same semester*.

Learning objectives:

The student

- knows and understands the fundamentals of deterministic global optimization in the nonconvex case,
- is able to choose, design and apply modern techniques of deterministic global optimization in the nonconvex case in practice.

Literature

O. Stein, Basic Concepts of Global Optimization, Springer, 2024

Weiterführende Literatur:

- W. Alt, Numerische Verfahren der konvexen, nichtglatten Optimierung, Teubner, 2004
- C.A. Floudas, Deterministic Global Optimization, Kluwer, 2000
- R. Horst, H. Tuy, Global Optimization, Springer, 1996
- A. Neumaier, Interval Methods for Systems of Equations, Cambridge University Press, 1990

T 7.105 Module component: Global Production [T-MACH-114800]

Coordinators: Prof. Dr.-Ing. Gisela Lanza
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each winter term	1

Courses					
WT 25/26	2149613	Global Production	2 SWS	Lecture /	Lanza
Exams					
WT 25/26	76- T-MACH-114800-WING	Global Production			Lanza

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Written Exam (60 min)

A grade bonus can be earned for successful participation in online case studies. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the course.

Prerequisites
T-MACH-108848 - Globale Produktion und Logistik - Teil 1: Globale Produktion must not be commenced.
T-MACH-105158 - Globale Produktion und Logistik - Teil 1: Globale Produktion must not be commenced.
T-MACH-110337 - Globale Produktion und Logistik must not be commenced.

Additional Information
The course is offered in English.

Workload
150 hours

Below you will find excerpts from courses related to this module component:

V Global Production

2149613, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Content

The course examines the planning, design and operation of global production networks of manufacturing companies. It gives an overview of the influencing factors and challenges of global production. In-depth knowledge of common methods and procedures for planning, designing and managing global production networks is imparted.

Therefore, the lecture first of all discusses the connections and interdependencies between the business strategy and the production strategy and illustrates necessary tasks for the definition of a production strategy. Methods for site selection, for the site-specific adaptation of product design and production technology as well as for the establishment of new production sites and for the adaptation of existing production networks to changing framework conditions are subsequently taught within the context of the design of the network footprint. With regard to the management of global production networks, the lecture addresses challenges associated with coordination, procurement and order management in global networks.

The lecture is complemented by an exercise that discusses the use of Industry 4.0 applications in the context of global production as well as current trends with regard to the planning, design and management of global production networks. The exercise is not relevant for Mechanical Engineering

The topics include:

- Basic conditions and influencing factors of global production (historical development, targets, chances and threats)
- Framework for planning, designing and managing global production networks
- Production strategies for global production networks
    - From business strategy to production strategy
    - Tasks of the production strategy (product portfolio management, circular economy, planning of production depth, production-related research and development)
- Design of global production networks
    - Basic types of network structures
    - Planning process for the design of the network footprint
    - Adaptation of the network footprint
    - Site selection
    - Location-specific adaptation of production technology and product design
- Management of global production networks
    - Network coordination
    - Procurement process
    - Order management

Exercise contents only for WiWis:

Exercise for Global Production coverring topics with respect to trends in resilience, sustainability and digitalisation in global production networks.

Learning Outcomes:

The students …

- can explain the challenges and enablers of global production networks and evaluate methods for decision support.
- are able to explain factors influencing decision-making in the design and operation of a global production network.
- are able to distinguish between corporate and business unit strategy as well as forms of growth and outsourcing.
- can explain the objectives of production and production network strategies as well as the ideal-typical forms of strategy
- are able to identify ideal-typical network structures of global production networks.
- can apply a network adjustment, taking into account the relevant aspects.
- can systematically analyse, evaluate and select new locations in the global production network.
- are able to apply challenges and solutions for location-specific manufacturing technology and product design.
- can evaluate the suitability of different forms of co-location of R&D and site roles for the sites in a production network.
- are able to explain the role distribution of sites, the management of external suppliers, order processing and demand planning in global production networks.

Workload MACH:
regular attendance: 21 hours
self-study: 99 hours

Workload WiWi:
regular attendance: 26 hours
self-study: 124 hours

Recommendations:

Combination with Strategic Decision-Making in Global Production Network Design: A Seminar on Optimisation and Simulation (76-T-MACH-113372) is recommended.

Literature

Medien

Skript zur Veranstaltung wird über (https://ilias.studium.kit.edu/) bereitgestellt

empfohlene Sekundärliteratur:
Abele, E. et al: Handbuch Globale Produktion, Hanser Fachbuchverlag, 2006 (deutsch)

Media

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/)

recommended secondary literature:
Abele, E. et al: Global Production – A Handbook for Strategy and Implementation, Springer 2008 (english)

7.106 Module component: Handling Characteristics of Motor Vehicles I [T-MACH-105152]

Coordinators: Dr.-Ing. Hans-Joachim Unrau
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101264 - Handling Characteristics of Motor Vehicles

Type	Credits	Grading	Term offered	Version
Oral examination	3 CP	graded	Each winter term	1

Courses					
WT 25/26	2113807	Handling Characteristics of Motor Vehicles I	2 SWS	Lecture / 🗣	Weitz
Exams					
WT 25/26	76-T-MACH-105152	Handling Characteristics of Motor Vehicles I			Weitz
ST 2026	76-T-MACH-105152	Handling Characteristics of Motor Vehicles I			Weitz

Legend: 🖥 Online, ✪ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Verbally

Duration: 30 up to 40 minutes

Auxiliary means: none

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

Handling Characteristics of Motor Vehicles I

Lecture (V)
On-Site

2113807, WS 25/26, 2 SWS, Language: German, Open in study portal

Content
1. Problem definition: Control loop driver - vehicle - environment (e.g. coordinate systems, modes of motion of the car body and the wheels)

2. Simulation models: Creation from motion equations (method according to D'Alembert, method according to Lagrange, programme packages for automatically producing of simulation equations), model for handling characteristics (task, motion equations)

3. Tyre behavior: Basics, dry, wet and winter-smooth roadway

Learning Objectives:

The students know the basic connections between drivers, vehicles and environment. They can build up a vehicle simulation model, with which forces of inertia, aerodynamic forces and tyre forces as well as the appropriate moments are considered. They have proper knowledge in the area of tyre characteristics, since a special meaning comes to the tire behavior during driving dynamics simulation. Consequently they are ready to analyze the most importent influencing factors on the driving behaviour and to contribute to the optimization of the handling characteristics.

Organizational issues

Die Vorlesung wird als Videostream zur Verfügung gestellt. Sie finden den Videostream und das Vorlesungsmaterial auf ILIAS. Das ILIAS-Passwort erhalten Sie unter https://fast-web-01.fast.kit.edu/PasswoerterIlias/

Literature

1. Willumeit, H.-P.: Modelle und Modellierungsverfahren in der Fahrzeugdynamik,
B. G. Teubner Verlag, 1998

2. Mitschke, M./Wallentowitz, H.: Dynamik von Kraftfahrzeugen, Springer-Verlag, Berlin, 2004

3. Gnadler, R.; Unrau, H.-J.: Umdrucksammlung zur Vorlesung Fahreigenschaften von Kraftfahrzeugen I

T 7.107 Module component: Handling Characteristics of Motor Vehicles II [T-MACH-105153]

Coordinators: Dr.-Ing. Hans-Joachim Unrau
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101264 - Handling Characteristics of Motor Vehicles

Type	Credits	Grading	Term offered	Version
Oral examination	3 CP	graded	Each summer term	1

Courses					
ST 2026	2114838	Handling Characteristics of Motor Vehicles II	2 SWS	Lecture / 🗣	Weitz
Exams					
WT 25/26	76-T-MACH-105153	Handling Characteristics of Motor Vehicles II			Weitz
ST 2026	76-T-MACH-105153	Handling Characteristics of Motor Vehicles II			Weitz

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Handling Characteristics of Motor Vehicles II

2114838, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
1. Vehicle handling: Bases, steady state cornering, steering input step, single sine, double track switching, slalom, cross-wind behavior, uneven roadway

2. stability behavior: Basics, stability conditions for single vehicles and for vehicles with trailer

Learning Objectives:

The students have an overview of common test methods, with which the handling of vehicles is gauged. They are able to interpret results of different stationary and transient testing methods. Apart from the methods, with which e.g. the driveability in curves or the transient behaviour from vehicles can be registered, also the influences from cross-wind and from uneven roadways on the handling characteristics are well known. They are familiar with the stability behavior from single vehicles and from vehicles with trailer. Consequently they are ready to judge the driving behaviour of vehicles and to change it by specific vehicle modifications.

Literature
1. Zomotor, A.: Fahrwerktechnik: Fahrverhalten, Vogel Verlag, 1991

2. Mitschke, M./Wallentowitz, H.: Dynamik von Kraftfahrzeugen, Springer-Verlag, Berlin, 2004

3. Gnadler, R.; Unrau, H.-J.: Umdrucksammlung zur Vorlesung Fahreigenschaften von Kraftfahrzeugen II

T 7.108 Module component: High Performance Powder Metallurgy Materials [T-MACH-102157]

Coordinators: apl. Prof. Dr. Günter Schell
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101262 - Emphasis Materials Science

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each summer term	1

Courses					
ST 2026	2126749	Advanced powder metals	2 SWS	Lecture / Blended	Schell
Exams					
WT 25/26	76-T-MACH-102157	High Performance Powder Metallurgy Materials			Schell
ST 2026	76-T-MACH-102157	High Performance Powder Metallurgy Materials			Schell

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
oral exam, 20- 30 min

Prerequisites
none

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Advanced powder metals

2126749, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Literature

- W. Schatt ; K.-P. Wieters ; B. Kieback. ".Pulvermetallurgie: Technologien und Werkstoffe", Springer, 2007
- R.M. German. "Powder metallurgy and particulate materials processing. Metal Powder Industries Federation, 2005
- F. Thümmler, R. Oberacker. "Introduction to Powder Metallurgy", Institute of Materials, 1993

T 7.109 Module component: HR-Management 1: HR Strategies in the Age of AI [T-WIWI-113745]

Coordinators: Prof. Dr. Petra Nieken
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-105928 - HR Management & Digital Workplace
M-WIWI-106860 - Leadership & Sustainable HR-Management

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2573005	HR-Management 1: HR strategies in the age of AI	2 SWS	Lecture / 🗣	Nieken
WT 25/26	2573006	Übung zu HR-Management 1: HR Strategies in the age of AI	1 SWS	Practice / 🗣	Nieken, Mitarbeiter
Exams					
WT 25/26	7900200	HR-Management 1: HR strategies in the age of AI (formerly Human Resource Management)			Nieken
ST 2026	7900134	HR-Management 1: HR strategies in the age of AI (formerly Human Resource Management)			Nieken

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment is conducted in the form of an oral (30 minutes) or written (60 minutes) examination (according to §4(2), 1 examination regulations). The exam is offered every semester and can be retaken at any regular examination date.

Prerequisites
None

Recommendations
Prior attendance of the Business Administration module is recommended.

Below you will find excerpts from courses related to this module component:

V HR-Management 1: HR strategies in the age of AI

Lecture (V)
On-Site

2573005, WS 25/26, 2 SWS, Language: German, Open in study portal

Content
In this course, students will acquire fundamental knowledge in the field of human resource management and delve deeply into the future of work. We explore not only classical topics but also the significance of artificial intelligence in the workplace, along with selected aspects related to sustainability and shaping the future of work. Drawing from microeconomic and behavioral economic approaches, we analyze various processes and tools in human resource management. We evaluate their alignment with corporate strategy. We investigate how we can design workplaces sustainably while considering the individual needs of employees. In addition, we look at how AI is transforming our work environment and the opportunities and challenges it presents.
Going beyond theoretical concepts, we validate our insights using real-world data from research papers and current events. Discussions are strongly encouraged!

Learning Outcomes

The student

- understands the processes and instruments of human resource management.
- analyzes different methods and evaluates their usefulness with a special focus on AI.
- analyzes different processes and evaluates the strengths and weaknesses.
- understands the challenges of human resource management and its link to corporate strategy with a special focus on AI and sustainability aspects.
- posses knowledge about the applicability and challenges of different scientific research methods and open science.

Workload

The total workload for this course is approximately 135 hours.

Lecture: 32 hours

Preparation of lecture: 52 hours

Exam preparation: 51 hours

Literature

- Personalmanagement, Stock-Homburg, 2019
- Personnel Economics, Kuhn, 2017
- Research papers and case studies (will be provided during the lecture)

T 7.110 Module component: HR-Management 2: Organization, Fairness & Leadership [T-WIWI-114178]

Coordinators: Prof. Dr. Petra Nieken
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101668 - Economic Policy I
M-WIWI-106860 - Leadership & Sustainable HR-Management

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	1

Courses					
ST 2026	2573001	HR-Management 2: Organization, Fairness & Leadership	2 SWS	Lecture / 🗣	Nieken
ST 2026	2573002	Übung zu HR-Management 2: Organization, Fairness & Leadership	1 SWS	Practice / 🗣	Nieken, Mitarbeiter, Gorny
Exams					
WT 25/26	7900202	HR-Management 2: Organisation, Fairness & Leadership (ehemals Personalpolitik und Arbeitsmarktinstitutionen)			Nieken
ST 2026	7900133	HR-Management 2: Organization, Fairness & Leadership (formerly Personnel Policies and Labor Market Institutions)			Nieken

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment of this course is a written examination of 1 hour. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.
In case of a small number of registrations, we might offer an oral exam instead of a written exam.

Prerequisites
None

Recommendations
Completion of module Business Administration is recommended.

Basic knowledge of microeconomics, game theory, and statistics is recommended.

Below you will find excerpts from courses related to this module component:

V HR-Management 2: Organization, Fairness & Leadership
2573001, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

In the course, we explore central aspects of the working world. Students gain a deep understanding of the dynamics of wage and collective bargaining negotiations and critically engage with compensation structures within companies. A special focus lies in creating a sustainable workplace that meets both employees' needs and society's ecological and social demands. Additionally, we address topics related to diversity and inclusion. Students develop innovative approaches to leadership and new forms of work that are increasingly relevant in the modern work environment. Our analyses are based on microeconomic and behavioral economic approaches, evaluating their alignment with corporate strategy. We move beyond theoretical concepts, examining our insights using real-world data from research papers and current events. Discussions are explicitly encouraged!

Aim

The student

- understands the process and instruments of HR-Management with a focus on fair working conditions, sustainability, and leadership.
- analyzes various methods and evaluates their usefulness, particularly regarding fairness and leadership in organizations.
- analyzes various processes and assesses their strengths and weaknesses.
- evaluates the strengths and weaknesses of existing structures and regulations based on systematic criteria.
- possess knowledge about the applicability and challenges of different scientific research methods

Workload

The total workload for this course is approximately 135 hours.

Lecture 32 hours

Preparation of lecture 52 hours

Exam preparation 51 hours

Literature

- Arbeitsmarktökonomik, W. Franz, Springer, 2013
- The Nature of Leadership, Antonakis, J. Day, D. 2017

T 7.111 Module component: Hydraulic Engineering and Water Management [T-BGU-101667]

Coordinators: Prof. Dr. Mario Jorge Rodrigues Pereira da Franca
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	4 CP	graded	Each term	1 semesters	1

Courses					
WT 25/26	6200511	Hydraulic Engineering	2 SWS	Lecture / 🗣	Rodrigues Pereira da Franca
WT 25/26	6200512	Hydraulic Engineering - Excercise	1 SWS	Practice / 🗣	Seidel
Exams					
WT 25/26	8230101667	Hydraulic Engineering and Water Management			Rodrigues Pereira da Franca

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
written exam with 60 minutes

Prerequisites
None

Recommendations
None

Additional Information
None

Workload
120 hours

T 7.112 Module component: Hydrogen and reFuels - Energy Conversion in Combustion Engines [T-MACH-111585]

Coordinators: Dr.-Ing. Heiko Kubach
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101275 - Combustion Engines I

Type	Credits	Grading	Term offered	Expansion	Version
Oral examination	4 CP	graded	Each winter term	1 semesters	2

Courses					
WT 25/26	2134155	Hydrogen and reFuels - Energy Conversion in Combustion Engines	3 SWS	Lecture / Practice / 🗣	Koch
Exams					
WT 25/26	76-T-MACH-111585	Hydrogen and reFuels - Energy Conversion in Combustion Engines			Kubach, Koch
ST 2026	76-T-MACH-105564	Hydrogen and reFuels - Energy Conversion in Combustion Engines			Koch

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral exam, appr. 25 minutes, no auxillary means

Prerequisites
T-MACH-113979 must not have been started.

Workload
120 hours

T 7.113 Module component: Hydrology [T-BGU-101693]

Coordinators: Prof. Dr.-Ing. Erwin Zehe
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	4 CP	graded	Each term	1 semesters	2

Courses					
WT 25/26	6200513	Hydrology	2 SWS	Lecture / 🗣	Zehe, Wienhöfer
WT 25/26	6200514	Tutorial Hydrology	1 SWS	Practice / 🗣	Zehe, Wienhöfer
Exams					
WT 25/26	8230101693	Hydrology			Wienhöfer, Zehe

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
written exam, 60 min.

Prerequisites
None

Recommendations
None

Additional Information
None

Workload
120 hours

T 7.114 Module component: Ignition Systems [T-MACH-105985]

Coordinators: Dr.-Ing. Olaf Toedter
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101303 - Combustion Engines II

Type	Credits	Grading	Version
Oral examination	4 CP	graded	1

Courses					
WT 25/26	2133125	Ignition systems	3 SWS	Lecture / 🗣	Toedter
Exams					
WT 25/26	76-T-MACH-105985	Ignition systems			Koch
ST 2026	76-T-MACH-105985	Ignition systems			Toedter

Legend: 🖥 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral exam, 20 min

Prerequisites
none

Additional Information
This course is offered in German.

Workload
120 hours

T 7.115 Module component: Industrial Organization [T-WIWI-102844]

Coordinators: Prof. Dr. Johannes Philipp Reiß
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101499 - Applied Microeconomics
M-WIWI-101501 - Economic Theory

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Irregular	1

Courses					
ST 2026	2560238	Industrial Organization	2 SWS	Lecture / 🗣	Reiß
ST 2026	2560239	Übung zu Industrieökonomie	1 SWS	Practice / 🗣	Reiß, Potarca
Exams					
WT 25/26	7910003	Industrial Organization			Reiß

Legend: 🖥 Online, ✲ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Recommendations
Completion of the module Economics [WW1VWL] is assumed.

Additional Information
This course is not given in summer 2017.

Below you will find excerpts from courses related to this module component:

V Industrial Organization

2560238, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Literature
Verpflichtende Literatur:

H. Bester (2012): Theorie der Industrieökonomik, Springer-Verlag.

Ergänzende Literatur:

J. Tirole (1988): Theory of Industrial Organization, MIT Press.

D. Carlton / J. Perloff (2005): Modern Industrial Organization, Pearson.

P. Belleflamme / M. Peitz (2010): Industrial Organization

T 7.116 Module component: Integrated Production Planning in the Age of Industry 4.0 [T-MACH-109054]

Coordinators: Prof. Dr.-Ing. Gisela Lanza
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101272 - Integrated Production Planning

Type	Credits	Grading	Term offered	Version
Written examination	9 CP	graded	Each summer term	1

Courses					
ST 2026	2150660	Integrated Production Planning in the Age of Industry 4.0	6 SWS	Lecture / Practice /	Lanza
Exams					
WT 25/26	76-T-MACH-109054	Integrated Production Planning in the Age of Industry 4.0			Lanza

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Assessment
Written Exam (120 min)

Prerequisites
"T-MACH-108849 - Integrierte Produktionsplanung im Zeitalter von Industrie 4.0" as well as "T-MACH-102106 Integrierte Produktionsplanung" must not be commenced.

Additional Information
The course is offered in German.

Workload
270 hours

Below you will find excerpts from courses related to this module component:

V Integrated Production Planning in the Age of Industry 4.0

Lecture / Practice (VÜ)
On-Site

2150660, SS 2026, 6 SWS, Language: German, Open in study portal

Content

Integrated Production Planning in the age of Industry 4.0 will be taught in the context of this engineering science lecture. In addition to a comprehensive introduction to Industry 4.0, the following topics will be addressed at the beginning of the lecture:

- Basics, history and temporal development of production
- Integrated production planning and integrated digital engineering
- Principles of integrated production systems and further development with Industry 4.0

Building on this, the phases of integrated production planning are taught in accordance with VDI Guideline 5200, whereby special features of parts production and assembly are dealt with in the context of case studies:

- Factory planning system
- Definition of objectives
- Data collection and analysis
- Concept planning (structural development, structural dimensioning and rough layout)
- Detailed planning (PPS, process simulation as a validation tool, planning of conveyor technology and storage systems for linking production and IT systems in the I4.0 factory)
- Preparation and monitoring of implementation
- Start-up and series support

The lecture contents are complemented by numerous current practical examples with a strong Industry 4.0 reference. Aspects of sustainability are anchored in all units and thus basic knowledge of sustainable production planning is taught. Within the exercises the lecture contents are deepened and applied to specific problems and tasks.

Learning Outcomes:

The students …

- can discuss basic questions of production technology.
- are able to apply the methods of integrated production planning to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques for a specific problem.
- can apply the learned methods of integrated production planning to new problems.
- can use their knowledge targeted for efficient production technology.
- know the basic features of sustainable production planning and can apply underlying knowledge.

Workload:

MACH:
regular attendance: 63 hours
self-study: 177 hours
WING:
regular attendance: 63 hours
self-study: 207 hours

Organizational issues

Vorlesungstermine dienstags 14.00 Uhr und donnerstags 14.00 Uhr, Übungstermine donnerstags 15.45 Uhr. Bekanntgabe der konkreten Übungstermine erfolgt in der ersten Vorlesung

Literature
Medien:
Skript zur Veranstaltung wird über (https://ilias.studium.kit.edu/) bereitgestellt.

Media:
Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/).

T 7.117 Module component: Integrative Strategies in Production and Development of High Performance Cars [T-MACH-105188]

Coordinators: Karl-Hubert Schlichtenmayer
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	graded	Each summer term	1

Courses					
ST 2026	2150601	Integrative Strategies in Production and Development of High Performance Cars	2 SWS	Lecture / 🗣	Schlichtenmayer
Exams					
WT 25/26	76-T-MACH-105188	Integrative Strategies in Production and Development of High Performance Cars			Schlichtenmayer

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, × Cancelled

Assessment
Written Exam (60 min)

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Integrative Strategies in Production and Development of High Performance Cars

2150601, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

The lecture deals with the technical and organizational aspects of integrated development and production of sports cars on the example of Porsche AG. The lecture begins with an introduction and discussion of social trends. The deepening of standardized development processes in the automotive practice and current development strategies follow. The management of complex development projects is a first focus of the lecture. The complex interlinkage between development, production and purchasing are a second focus. Methods of analysis of technological core competencies complement the lecture. The course is strongly oriented towards the practice and is provided with many current examples.

The main topics are:

- Introduction to social trends towards high performance cars
- Automotive Production Processes
- Integrative R&D strategies and holistic capacity management
- Management of complex projects
- Interlinkage between R&D, production and purchasing
- The modern role of manufacturing from a R&D perspective
- Global R&D and production
- Methods to identify core competencies

Learning Outcomes:

The students ...

- are capable to specify the current technological and social challenges in automotive industry.
- are qualified to identify interlinkages between development processes and production systems.
- are able to explain challenges and solutions of global markets and global production of premium products.
- are able to explain modern methods to identify key competences of producing companies.

Workload:

regular attendance: 21 hours
self-study: 99 hours

Literature

Medien:
Skript zur Veranstaltung wird über (https://ilias.studium.kit.edu/) bereitgestellt.

Media:
Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/).

T 7.118 Module component: International Finance [T-WIWI-102646]

Coordinators: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101402 - eFinance
M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	see Annotations	1

Courses					
ST 2026	2530570	International Finance	2 SWS	Lecture / 🗣	Walter, Uhrig-Homburg
Exams					
WT 25/26	7900052	International Finance			Uhrig-Homburg
ST 2026	7900097	International Finance			Uhrig-Homburg

Legend: 📱 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The success control takes place in form of a written examination (60 min). If the number of participants is low, an oral examination may also be offered. The examination is offered every semester and can be repeated at any regular examination date.

Prerequisites
None

Recommendations
None

Additional Information
The course is offered as a 14-day or block course.

Below you will find excerpts from courses related to this module component:

V International Finance
2530570, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Organizational issues
Kickoff am Mittwoch, 29.04.26, 16:00 - 19:15 Uhr im Raum 320 im Geb. 09.21 (Blücherstr. 17). Die Veranstaltung wird samstags als Blockveranstaltung angeboten (nach dem Kickoff nach Absprache).

Literature
Weiterführende Literatur:

- Eiteman, D. et al., Multinational Business Finance, 13. Auflage, 2012.
- Solnik, B. und D. McLeavey, Global Investments, 6. Auflage, 2008.

T 7.119 Module component: Internship [T-WIWI-102611]

Coordinators: Studiendekan des KIT-Studienganges
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101419 - Internship

Type	Credits	Grading	Version
Coursework	10 CP	pass/fail	2

Assessment
see module description

Prerequisites
Kein

7.120 Module component: Introduction to Bionics [T-MACH-111807]

Coordinators: apl. Prof. Dr. Hendrik Hölscher
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101287 - Microsystem Technology

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each summer term	3

Courses					
ST 2026	2142151	Introduction to Biomimetics	2 SWS	Lecture / On-Site	Hölscher
Exams					
WT 25/26	76-T-MACH-102172	Introduction into Biomimetics			Hölscher
ST 2026	76-T-MACH-102172	Introduction into Biomimetics			Hölscher

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
written exam (duration: 60 minutes)

Prerequisites
none

Additional Information
Module component T-MACH-102172 may not be started

Below you will find excerpts from courses related to this module component:

V Introduction to Biomimetics

2142151, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
Bionics focuses on the design of technical products following the example of nature. For this purpose we have to learn from nature and to understand its basic design rules. Therefore, the lecture focuses on the analysis of the fascinating effects used by many plants and animals. Possible implementations into technical products are discussed in the end.

The students should be able analyze, judge, plan and develop biomimetic strategies and products.

Basic knowledge in physics and chemistry

The successfull attandence of the lecture is controlled by a written examination.

Organizational issues
Im ILIAS werden Materialien (Videos, Originalliteratur, Übungen) zur Vertiefung zur Verfügung gestellt.

Für die schriftliche Klausur werden zwei Termine angeboten (erste Woche nach Vorlesungsende im Sommersemester und eine Woche vor Vorlesungsbeginn im Wintersemester).

Literature
Folien und Literatur werden in ILIAS zur Verfügung gestellt.

T 7.121 Module component: Introduction to Ceramics [T-MACH-100287]

Coordinators: Prof. Dr. Kaline Pagnan Furlan
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101262 - Emphasis Materials Science

Type	Credits	Grading	Term offered	Version
Oral examination	6 CP	graded	Each winter term	1

Courses					
WT 25/26	2125757	Introduction to Ceramics	3 SWS	Lecture /	Pagnan Furlan, Wagner, Ribas Gomes
Exams					
WT 25/26	76-T-MACH-100287	Introduction to Ceramics			Pagnan Furlan, Wagner, Bucharsky
ST 2026	76-T-MACH-100287	Introduction to Ceramics			Pagnan Furlan, Wagner, Ribas Gomes, Bucharsky

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Assessment
The assessment consists of an oral exam (30 min) taking place at a specific date.

The re-examination is offered at a specific date.

Prerequisites
None

Workload
180 hours

Below you will find excerpts from courses related to this module component:

V Introduction to Ceramics

2125757, WS 25/26, 3 SWS, Language: German, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Content
This course provides a comprehensive introduction to ceramic materials, covering chemical bonding, crystal structures, crystal defects, phases, and phase diagrams. Students learn about powder preparation, shaping, and sintering (solid- and liquid-phase), as well as microstructure development and grain growth. The course explores mechanical, electrical, and other functional properties, linking structure and processing to performance. Lectures are complemented by exercises to apply theory to practical problems and design considerations.

Literature

- Callister William D., Rethwisch David G., Scheffler Michael: *Materialwissenschaften und Werkstofftechnik*, Wiley-VCH Verlag, Weinheim, 2013.
  Online verfügbar: http://textbooks.wiley-vch.de/book/callister0072/ *
- Salmang H., Scholze H., Telle R.: *Keramik*, Springer Berlin Heidelberg, 2007.
  Online verfügbar: https://link.springer.com/book/10.1007/978-3-540-49469-0 *
- Kollenberg Wolfgang: *Technische Keramik*, Vulkan-Verlag, Essen, 2004.
  Online-Katalog: Link zur Bibliothek
- Richerson David W.: *Modern ceramic engineering*, CRC Press, Boca Raton, FL, 2018.
  Verfügbar im Netz des KIT: https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&db=nlabk&AN=1802218 *

** Zugang möglich im Netz des KIT.*

T 7.122 Module component: Introduction to Econometrics [T-WIWI-114622]

Coordinators: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101499 - Applied Microeconomics
M-WIWI-101599 - Statistics and Econometrics
M-WIWI-105414 - Statistics and Econometrics II

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each summer term	1

Courses					
ST 2026	2520016	Introduction to Econometrics	2 SWS	Lecture / 🗣	Schienle, Bracher
ST 2026	2520017	Übungen zu Einführung in die Ökonometrie	2 SWS	Practice	Schienle, Rüter, Bracher, Leimenstoll
Exams					
WT 25/26	7900002	Introduction in Econometrics			Schienle

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Success is assessed in the form of a written examination lasting 1 hour.

Grade Bonus through Bonus Exercises: By achieving qualified participation in at least 80% of the bonus exercises accompanying the lectures, students can earn a grade bonus for the examinations directly following the semester. This bonus of three points (out of a maximum of 90 points for the exam) will only be credited if the examination is considered passed without the application of this bonus. The grade bonus can thus result in an improvement of up to one grade increment.

Prerequisites
None

Below you will find excerpts from courses related to this module component:

V Introduction to Econometrics

2520016, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
Learning objectives:

- Familiarity with the basic concepts and methods of econometrics
- Preparation of simple econometric surveys

Content:

- Simple and multiple linear regression (estimating parameters, confidence interval, testing, prognosis, testing assumptions)
- Model assessment

Requirements:

Knowledge of the lectures Statistics I + II is required.

Workload:

Total workload for 5 CP: approx. 150 hours

Attendance: 30 hours

Preparation and follow-up: 120 hours

Literature
Von Auer: Ökonometrie ISBN 3-540-00593-5

Goldberger: A course in Econometrics ISBN 0-674-17544-1

Gujarati. Basic Econometrics ISBN 0-07-113964-8

Schneeweiß: Ökonometrie ISBN 3-7908-0008-2

T 7.123 Module component: Introduction to Energy Economics [T-WIWI-102746]

Coordinators: Prof. Dr. Wolf Fichtner
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101464 - Energy Economics

Type	Credits	Grading	Term offered	Version
Written examination	5,5 CP	graded	Each summer term	7

Courses					
ST 2026	2581010	Introduction to Energy Economics	2 SWS	Lecture / 🗣	Fichtner
ST 2026	2581011	Übungen zu Einführung in die Energiewirtschaft	2 SWS	Practice / 🗣	Layer, Fichtner, Raab
Exams					
WT 25/26	7981010	Introduction to Energy Economics			Fichtner
ST 2026	7981010	Introduction to Energy Economics			Fichtner

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (90 minutes) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None.

Below you will find excerpts from courses related to this module component:

V Introduction to Energy Economics

2581010, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

1. Introduction: terms, units, conversions
2. The energy carrier gas (reserves, resources, technologies)
3. The energy carrier oil (reserves, resources, technologies)
4. The energy carrier hard coal (reserves, resources, technologies)
5. The energy carrier lignite (reserves, resources, technologies)
6. The energy carrier uranium (reserves, resources, technologies)
7. The final carrier source electricity
8. The final carrier source heat
9. Other final energy carriers (cooling energy, hydrogen, compressed air)

The student is able to

- characterize and judge the different energy carriers and their peculiarities,
- understand contexts related to energy economics.

Literature
Weiterführende Literatur:

Pfaffenberger, Wolfgang. Energiewirtschaft. ISBN 3-486-24315-2

Feess, Eberhard. Umweltökonomie und Umweltpolitik. ISBN 3-8006-2187-8

Müller, Leonhard. Handbuch der Elektrizitätswirtschaft. ISBN 3-540-67637-6

Stoft, Steven. Power System Economics. ISBN 0-471-15040-1

Erdmann, Georg. Energieökonomik. ISBN 3-7281-2135-5

T 7.124 Module component: Introduction to Engineering Geology [T-BGU-101500]

Coordinators: Prof. Dr. Philipp Blum
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each winter term	1

Courses					
WT 25/26	6339057	Introduction to Engineering Geology	4 SWS	Lecture / Practice	Blum, Menberg, Steger
Exams					
WT 25/26	8210_101500	Introduction to Engineering Geology			Blum

Prerequisites
none

Workload
150 hours

T 7.125 Module component: Introduction to Engineering Mechanics I: Statics and Strength of Materials [T-MACH-102208]

Coordinators: Prof. Dr.-Ing. Alexander Fidlin
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101259 - Engineering Mechanics

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each summer term	2

Courses					
ST 2026	2162265	Introduction to Engineering Mechanics I: Statics and Strength of Materials (Tutorial)	2 SWS	Practice / 🗣	Fidlin, Ströhle, Thasan
ST 2026	2162274	Introduction to Engineering Mechanics I: Statics and Strength of Materials	2 SWS	Lecture / 🗣	Fidlin, Ströhle
Exams					
WT 25/26	76-T-MACH-102208-1	Introduction to Engineering Mechanics I: Statics (75min)			Fidlin, Ströhle
WT 25/26	76-T-MACH-102208-2	Introduction to Engineering Mechanics I: Statics and Strength of Materials (120min)			Fidlin, Ströhle

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written examination (120 min) taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination takes place in every semester. Re-examinations are offered at eyery ordinary examination date.

For students of economics the assessement consists of a written examination (Statics - 75 min.)

Permitted utilities: non-programmable calculator

Prerequisites
None

Additional Information
The course is offered in German.

Workload
150 hours

T 7.126 Module component: Introduction to Engineering Mechanics II : Dynamics [T-MACH-102210]

Coordinators: Prof. Dr.-Ing. Alexander Fidlin
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101261 - Emphasis in Fundamentals of Engineering
M-WIWI-101839 - Additional Fundamentals of Engineering

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each winter term	1

Courses					
WT 25/26	2161276	Introduction to Engineering Mechanics II : Dynamics	2 SWS	Lecture / 🗣	Fidlin, Ströhle
Exams					
WT 25/26	76-T-MACH-102210	Introduction to Engineering Mechanics II : Dynamics			Fidlin, Ströhle

Legend: 🖥 Online, ❖ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written examination (75 min) taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination is offered every semester. Re-examinations are offered at every ordinary examination date.

Permitted utilities: non-programmable calculator, literature.

Prerequisites
None

Additional Information
The course is offered in German.

Below you will find excerpts from courses related to this module component:

V Introduction to Engineering Mechanics II : Dynamics
Lecture (V)
On-Site

2161276, WS 25/26, 2 SWS, Language: German, Open in study portal

T 7.127 Module component: Introduction to Finance and Accounting [T-WIWI-112820]

Coordinators: Dr. Torsten Luedecke
Prof. Dr. Martin Ruckes
Prof. Dr. Marcus Wouters

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-105769 - Financing and Accounting

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each summer term	2

Courses					
ST 2026	2500002	Jahresabschluss und Bewertung	1 SWS	Lecture	Ruckes, Luedecke
ST 2026	2500025	Tutorial Introduction to Finance and Accounting	2 SWS	Tutorial	Wouters, Ruckes, Assistenten, Kohl
ST 2026	2610026	Introduction to Finance and Accounting	2 SWS	Lecture / 🗣	Ruckes, Wouters, Thimme
Exams					
WT 25/26	7900005	Financing and Accounting			Ruckes, Wouters, Luedecke
ST 2026	7900043	Financing and Accounting			Ruckes, Wouters, Luedecke

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written examination (2.5 hours) takes place as part of the examination course "Financing and Accounting" and covers the content of the two courses "Introduction to Finance and Accounting" and "Annual Financial Statements and Valuation". The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible on every regular examination date.

Workload
150 hours

Below you will find excerpts from courses related to this module component:

V Introduction to Finance and Accounting

2610026, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The lecture covers the following topics:

- Investment and Finance
  - Valuation of Bonds and Stocks
  - Capital Budgeting
  - Portfolio Theory
- Financial Accounting
- Management Accounting

Literature
Ausführliche Literaturhinweise werden in den Materialen zur Vorlesung gegeben.

T 7.128 Module component: Introduction to Game Theory [T-WIWI-102850]

Coordinators: Prof. Dr. Clemens Puppe
Prof. Dr. Johannes Philipp Reiß

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-101499 - Applied Microeconomics
M-WIWI-101501 - Economic Theory

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	3

Courses					
ST 2026	2520525	Introduction to Game Theory	2 SWS	Lecture / 🗣	Rosar, Puppe, Ammann
ST 2026	2520526	Übungen zu Einführung in die Spieltheorie	1 SWS	Practice / 🗣	Puppe, Rosar, Ammann
Exams					
WT 25/26	7910001	Introduction to Game Theory			Reiß
ST 2026	7910001	Introduction to Game Theory			Puppe

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (60 minutes) according to Section 4(2),1 of the examination regulation.

The exam takes place in the recess period and can be repeated at every ordinary examination date.

Recommendations
Knowledge from the lecture "Economics I: Microeconomics" is recommended. Furthermore, basic knowledge of mathematics and statistics is assumed.

Below you will find excerpts from courses related to this module component:

V Introduction to Game Theory

2520525, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The course focusses on non-cooperative game theory. It discusses models, solution concepts, and applications for simultaneous games as well as sequential games. Various solution concepts, e.g., Nash equilibrium and subgame-perfect equilibrium, are introduced along with more advanced concepts.

This course offers an introduction to the theoretical analysis of strategic interaction situations. At the end of the course, students shall be able to analyze situations of strategic interaction systematically and to use game theory to predict outcomes and give advice in applied economics settings.

Literature
Verpflichtende Literatur:

Gibbons (1992): A Primer in Game Theory, Harvester-Wheatsheaf.

Ergänzende Literatur:

Berninghaus/Ehrhart/Güth (2010): Strategische Spiele, Springer Verlag.

Binmore (1991): Fun and Games, DC Heath.

Fudenberg/Tirole (1991): Game Theory, MIT Press.

Heifetz (2012): Game Theory, Cambridge Univ. Press.

T 7.129 Module component: Introduction to GIS for Students of Natural, Engineering and Geo Sciences [T-BGU-101681]

Coordinators: Dr.-Ing. Sven Wursthorn
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each winter term	5

Courses					
WT 25/26	6071101	Introduction to GIS for Students of Natural Sciences, Engineering and Geosciences, L+E	4 SWS	Lecture / Practice / 🗣	Wursthorn
Exams					
WT 25/26	8280101681	Introduction to GIS for Students of Natural, Engineering and Geo Sciences			Wursthorn

Legend: 🖥 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
written exam, 90 min.

Workload
90 hours

T 7.130 Module component: Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite [T-BGU-103541]

Coordinators: Dr.-Ing. Sven Wursthorn
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Term offered	Expansion	Version
Coursework	3 CP	pass/fail	Each winter term	1 semesters	5

Courses					
WT 25/26	6071101	Introduction to GIS for Students of Natural Sciences, Engineering and Geosciences, L+E	4 SWS	Lecture / Practice / 🗣	Wursthorn
Exams					
WT 25/26	8280103541	Introduction to GIS for Students of Natural, Engineering and Geo Sciences			Wursthorn

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The achievement control takes place via accepted exercises.

Prerequisites
none

Recommendations
none

Additional Information
none

Workload
90 hours

T 7.131 Module component: Introduction to Machine Learning [T-WIWI-111028]

Coordinators: Prof. Dr. Andreas Geyer-Schulz
Dr. Abdolreza Nazemi

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-105482 - Machine Learning and Data Science

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	4,5 CP	graded	Each winter term	1 semesters	1

Courses					
WT 25/26	2540539	Introduction to Machine Learning	2 SWS	Lecture / 🗣	Nazemi
WT 25/26	2540540	Übung zu Introduction to Machine Learning	1 SWS	Practice / 🗣	Nazemi
Exams					
WT 25/26	7900349	Introduction to Machine Learning (WS 2025/2026)			Geyer-Schulz
ST 2026	7900076	Introduction to Machine Learning			Geyer-Schulz

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five-point-steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.
A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the course.

Please note: this exam will no longer be offered after August 2026.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Introduction to Machine Learning

2540539, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content

- Introduction
- Data Cleaning
- Data Visualization
- Linear Regression
- Logistic Regression
- Tree-based Algorithms
- Support Vector Machine
- Shrinkage Models
- Dimensionality Reduction
- Clustering

Literature

- Alpaydin, E. (2014). *Introduction to Machine Learning*. Third Edition, MIT Press.
- Hall, J. (2020). *Machine Learning in Business: An Introduction to the World of Data Science.*Independently published.
- James, G., Witten, D., Hastie, T., and R. Tibshirani (2013). *An Introduction to Statistical Learning: with Applications in R*. Springer.
- Tan, P. N., Steinbach, M., Karpatne, A., & Kumar, V. (2018). *Introduction to data mining*. Pearson

T 7.132 Module component: Introduction to Microsystem Technology - Practical Course [T-MACH-108312]

Coordinators: Dr. Arndt Last
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101287 - Microsystem Technology

Type	Credits	Grading	Term offered	Version
Coursework	3 CP	pass/fail	Each term	3

Courses					
WT 25/26	2143877	Introduction to Microsystem Technology - Practical Course	2 SWS	Practical course / 🗣	Last
ST 2026	2143877	Introduction to Microsystem Technology - Practical Course	2 SWS	Practical course / 🗣	Last
Exams					
WT 25/26	76-T-MACH-108312	Introduction to Microsystem Technology - Practical Course			Last
ST 2026	76-T-MACH-108312	Introduction to Microsystem Technology - Practical Course			Last

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
This practical course concludes with a written examination (duration 1 h). The assessment is not graded and may be repeated until it is passed.

Prerequisites
none

Additional Information
Please note that from the winter semester 2025/2026, the option to choose between the "Practical Training in Basics of Microsystem Technology" and "Introduction to Microsystem Technology - Practical Course" in the module M-MACH-101287 "Microsystem Technology" will no longer be available.

From this point onwards, students will only be able to choose the "Introduction to Microsystem Technology - Practical Course" component.

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V Introduction to Microsystem Technology - Practical Course
2143877, WS 25/26, 2 SWS, Language: German, Open in study portal

Practical course (P)
On-Site

Organizational issues
Das Praktikum findet in den Laboren des IMT am CN statt. Treffpunkt: Bau 301, vor dem Eingang.

Das "Laborpraktikum" ist das selbe wie das "Praktikum", nur unbenotet! Beide mit schriftlicher Klausur.

Wer teilnehmen möchte, muss sich ab 19.1.2026, 8h00 über das Campussystem unter Veranstaltungen (nicht unter Prüfungen!) auf die Warteliste setzen. Die endgültige Entscheidung, ob man teilnehmen kann, erfolgt erst 10.2.2026.

Literature
Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997
Unterlagen zum Praktikum zur Vorlesung ' Grundlagen der Mikrosystemtechnik'

V Introduction to Microsystem Technology - Practical Course
2143877, SS 2026, 2 SWS, Language: German, Open in study portal

Practical course (P)
On-Site

Content

In the practical training includes nine experiments:

1. X-ray optics
2. UVL + REM
3. Micromixer
4. Atomic force microscopy
5. 3D-Printing
6. Light dirffraction at Chromium masks
7. Moulding
8. SAW-bio-sensors
9. Nano3D-printer - material transfer of thin foils
10. Electro spinning

Each student takes part in only four experiments.
The experiments are carried out at real workstations at the IMT and coached by IMT-staff.

Organizational issues

Das Praktikum findet 14.-18.9.2026 an vier halben Tagen in den Laboren des IMT am KIT-CN statt. Treffpunkt: Eingang Bau 301.

Das "Laborpraktikum" ist das selbe wie das "Praktikum", nur unbenotet! Beide mit schriftlicher Klausur in der Woche danach, voraussichtlich am 24.9.2026.

Wer teilnehmen möchte, muss sich ab 6.7.2026, 8h00 über das Campussystem unter Veranstaltungen (nicht unter Prüfungen!) auf die Warteliste setzen. Die endgültige Entscheidung, ob man teilnehmen kann, erfolgt erst 31.8.2026.

Literature

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997
Unterlagen zum Praktikum zur Vorlesung ' Grundlagen der Mikrosystemtechnik'

T 7.133 Module component: Introduction to Microsystem Technology I [T-MACH-114100]

Coordinators: Dr. Vlad Badilita
Prof. Dr. Jan Gerrit Korvink

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101287 - Microsystem Technology

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each winter term	1

Courses					
WT 25/26	2141861	Introduction to Microsystem Technology I	2 SWS	Lecture / 🗣	Korvink, Badilita
Exams					
WT 25/26	76-T-MACH-114100	Introduction to Microsystem Technology I			Badilita

Legend: 📱 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
written examination (60 min)

Prerequisites
T-MACH-114035 and T-MACH-105182 must not have started

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Introduction to Microsystem Technology I

2141861, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Literature
Mikrosystemtechnik für Ingenieure, W. Menz und J. Mohr, VCH Verlagsgesellschaft, Weinheim 2005

M. Madou
Fundamentals of Microfabrication
Taylor & Francis Ltd.; Auflage: 3. Auflage. 2011

T 7.134 Module component: Introduction to Microsystem Technology II [T-MACH-114101]

Coordinators: Dr. Vlad Badilita
Prof. Dr. Jan Gerrit Korvink

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101287 - Microsystem Technology

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each summer term	1

Courses					
ST 2026	2142874	Introduction to Microsystem Technology II	2 SWS	Lecture / 🗣	Korvink, Badilita
Exams					
WT 25/26	76-T-MACH-114101	Introduction to Microsystem Technology II			Badilita

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
written examination (60 min)

Prerequisites
T-MACH-114035 and T-MACH-105183 must not have started

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Introduction to Microsystem Technology II

2142874, SS 2026, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
- Introduction in Nano- and Microtechnologies
- Lithography
- LIGA-technique
- Mechanical microfabrication
- Patterning with lasers
- Assembly and packaging
- Microsystems

Organizational issues
Topic: Grundlagen der Mikrosystemtechnik II (MST II) SS 21
Time: Thursdays 14:00 - 15:30

10.91 Redtenbacher-Hörsaal

Literature
Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005

M. Madou
Fundamentals of Microfabrication
Taylor & Francis Ltd.; Auflage: 3. Auflage. 2011

T 7.135 Module component: Introduction to Neural Networks and Genetic Algorithms [T-WIWI-111029]

Coordinators: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-105482 - Machine Learning and Data Science

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	4,5 CP	graded	Each summer term	1 semesters	1

Courses					
ST 2026	2540541	Introduction to Neural Networks and Genetic Algorithms	2 SWS	Lecture	Geyer-Schulz
ST 2026	2540542	Übung Introduction to Neural Networks and Genetic Algorithms	1 SWS	Practice	Geyer-Schulz
Exams					
WT 25/26	7900295	Introduction to Neural Networks and Genetic Algorithms (Nachklausur SoSe 2025)			Geyer-Schulz
ST 2026	7900241	Introduction to Neural Networks and Genetic Algorithms (Nachklausur SoSe 2026)			Geyer-Schulz
ST 2026	7900303	Introduction to Neural Networks and Genetic Algorithms			Geyer-Schulz

Assessment
Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five-point-steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.
A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the course.

Please note: this exam will no longer be offered after August 2026.

Additional Information
Please note: this course, exercises and exam will no longer be offered after August 2026.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Introduction to Neural Networks and Genetic Algorithms

Lecture (V)

2540541, SS 2026, 2 SWS, Language: English, Open in study portal

Content
The course consists of a short introduction and two parts:

1. In the introduction, the biological mechanisms of neural and genetic methods are presented.
   Furthermore, a common framework for the learning performance evaluation of these methods in applications is introduced.
2. In the field of genetic methods, simple genetic algorithms and their variants are introduced, analyzed, and applied.
3. In the area of neural methods, the basic algorithms are presented (e.g., backpropagation) as well as their applications in data science.

Learning Objectives:

The student knows the essential algorithms, learning procedures, and methods for neural networks and genetic algorithms. They can apply these methods (e.g. in R) and evaluate their quality.

Literature

- Goldberg, David E. (2001)
  Genetic Algorithms in Search, Optimization and Machine Learning.
  Addison-Wesley, New York.
- Bishop, Christopher M. (2006)
  Pattern Recognition and Machine Learning.
  Springer, New York.
- Goodfellow, Ian; Bengio, Yoshua; Courville, Aaron (2016)
  Deep Learning.
  MIT Press. Cambridge.

T 7.136 Module component: Introduction to Operations Research I and II [T-WIWI-102758]

Coordinators: Prof. Dr. Stefan Nickel
Prof. Dr. Steffen Rebennack
Prof. Dr. Oliver Stein

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-101418 - Introduction to Operations Research

Type	Credits	Grading	Term offered	Version
Written examination	9 CP	graded	see Annotations	2

Courses					
WT 25/26	2500030	Computer Exercises on Introduction to Operations Research II	1 SWS	Tutorial / Online	Dunke
WT 25/26	2530043	Introduction to Operations Reseasrch II	2 SWS	Lecture / On-Site	Stein
WT 25/26	2530044		2 SWS	Tutorial / On-Site	Dunke
ST 2026	2500008	Computer Exercises on Introduction to Operations Research I	1 SWS	Tutorial / Online	Dunke
ST 2026	2550040	Introduction to Operations Research I	2 SWS	Lecture / On-Site	Rebennack
ST 2026	2550043	Tutorials on Introduction to Operations Research I	2 SWS	Tutorial / On-Site	Dunke
Exams					
WT 25/26	00060	Introduction to Operations Research I and II			Stein

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
The assessment of the module is carried out by a written examination (120 minutes) according to Section 4(2), 1 of the examination regulation.
In each term (usually in March and August), one examination is held for both courses.
The overall grade of the module is the grade of the written examination.

Prerequisites
None

Recommendations
Knowledge of Mathematics I and II is recommended, as well as programming knowledge for the software laboratory.
It is strongly recommended to attend the course Introduction to Operations Research I [2550040] before attending the courseIntroduction to Operations Research II [2530043].

Workload
270 hours

Below you will find excerpts from courses related to this module component:

V Introduction to Operations Reseasrch II

2530043, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
Integer and combinatorial optimization: basic concepts, cutting plane methods, branch-and-bound methods, branch-and-cut methods, heuristic methods.

Nonlinear optimization: basic concepts, optimality conditions, solution methods for convex and nonconvex optimization problems.

Dynamic and stochastic models and methods: Dynamic optimization, Bellman methods, lot-sizing models and dynamic and stochastic models of inventory, queues.

Learning Objectives:

The student

- knows and describes the basic concepts of integer and combinatorial optimization, nonlinear optimization and dynamic optimization,
- knows the methods and models indispensable for a quantitative analysis,
- models and classifies optimization problems and selects appropriate solution procedures to solve simple optimization problems independently,
- validates, illustrates and interprets obtained solutions.

Literature

- Nickel, Rebennack, Stein, Waldmann: Operations Research, 3. Auflage, Springer, 2022
- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005
- Murty: Operations Research. Prentice-Hall, 1995
- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006
- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

V

Introduction to Operations Research I

2550040, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
Examples for typical OR problems.

Linear Programming: Basic notions, simplex method, duality, special versions of the simplex method (dual simplex method, three phase method), sensitivity analysis, parametric optimization, game theory.

Graphs and Networks: Basic notions of graph theory, shortest paths in networks, project scheduling, maximal and minimal cost flows in networks.

Learning objectives:

The student

- names and describes basic notions of linear programming as well as graphs and networks,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve optimization problems independently,
- validates, illustrates and interprets the obtained solutions.

Literature

- Nickel, Rebennack, Stein, Waldmann: Operations Research, 3. Auflage, Springer, 2022
- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005
- Murty: Operations Research. Prentice-Hall, 1995
- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006
- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

T 7.137 Module component: Introduction to Programming with Java [T-WIWI-102735]

Coordinators: Prof. Dr.-Ing. Johann Marius Zöllner
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101581 - Introduction to Programming

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each winter term	2

Courses					
WT 25/26	2511000	Introduction to Programming with Java	3 SWS	Lecture / 🗣	Zöllner
WT 25/26	2511002	Tutorien zu Programmieren I: Java	1 SWS	Tutorial	Zöllner, Stegmaier, Boualili
WT 25/26	2511003	Computer lab Introduction to Programming with Java	2 SWS		Zöllner, Stegmaier, Boualili
Exams					
WT 25/26	79AIFB_Prog1	Introduction to Programming with Java			Zöllner
ST 2026	7900042	Introduction to Programming with Java			Zöllner

Legend: 📱 Online, ❁ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written resp. computer-based exam (60 min) according to Section 4 (2),1 of the examination regulation.

The successful completion of the compulsory tests in the computer lab is prerequisited for admission to the written resp. computer-based exam.

The examination takes place every semester. Re-examinations are offered at every ordinary examination date.

Additional Information
see german version

Below you will find excerpts from courses related to this module component:

V Introduction to Programming with Java

2511000, WS 25/26, 3 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The lecture "Introduction to Programming with Java " introduces systematic programming and provides essential practical basics for all advanced computer science lectures.

Based on considerations of the structured and systematic design of algorithms, the most important constructs of modern higher programming languages as well as programming methods are explained and illustrated with examples. One focus of the lecture is on teaching the concepts of object-oriented Programming. Java is used as the programming language. Knowledge of this language is required in advanced computer science lectures.

At the end of the lecture period, a written examination will be held for which admission must be granted during the semester after successful participation in the practices. The exact details will be announced in the lecture.

Learning objectives:

- Knowledge of the fundamentals, methods and systems of computer science.
- The students acquire the ability to independently solve algorithmic problems in the programming language Java, which dominates in business applications.
- In doing so, they will be able to find strategic and creative answers in finding solutions to well-defined, concrete and abstract problems.

Workload:

The total workload for this course is approximately 150 hours. For further information see German version.

Literature

Ratz, D. Schulmeister-Zimolong, D. Seese, J. Wiesenberger. Grundkurs Programmieren in Java. 8. Aktualisierte und erweiterte Auflage, Hanser 2018

T 7.138 Module component: Introduction to Public Finance [T-WIWI-102877]

Coordinators: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101403 - Public Finance

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2560131	Introduction to Public Finance	3 SWS	Lecture / Blended	Wigger
Exams					
WT 25/26	790fiwi	Introduction to Public Finance			Wigger
ST 2026	790fiwi	Introduction to Public Finance			Wigger

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Assessment
Success is assessed in the form of a written examination (60 minutes). The examination is offered every semester and can be repeated at any regular examination date.

Prerequisites
None

Below you will find excerpts from courses related to this module component:

V Introduction to Public Finance

2560131, WS 25/26, 3 SWS, Language: German, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Content
The course *Introduction to Public Finance* provides an overview of the fundamental issues in public economics. The first part of the course deals with normative theories about the economic role of the state in a market economy. Welfare economics theory is offered as a base model, with which alternative normative theories are compared and contrasted. Within this theoretical framework, arguments concerning efficiency and equity are developed as justification for varying degrees of economic intervention by the state. The second part of the course deals with the positivist theory of public economics. Processes of public decision making are examined and the conditions that lead to market failures resulting from collective action problems are discussed. The third part of the course examines a variety of public spending programs, including social security systems, the public education system, and programs aimed at reducing poverty. The fifth part of the course addresses the key theoretical and political issues associated with fiscal federalism.

Learning goals:

Students are able to:

- critically assess the economic role of the state in a market economy
- explain and discuss key concepts in public finance, including: public goods; economic externalities; and market failure
- explain and critically discuss competing theoretical approaches to public finance, including welfare economics and public choice theory
- explain the theory of bureaucracy according to Weber and critically assess its strengths and weaknesses
- evaluate the incentives inherent in the bureaucratic model, as well as the more recent introduction of market-oriented incentives associated with public-sector reform

Workload:

The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Literatur:

Wigger, B. U. 2006. *Grundzüge der Finanzwissenschaft*. Springer: Berlin.

T 7.139 Module component: Introduction to Stochastic Optimization [T-WIWI-106546]

Coordinators: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101414 - Methodical Foundations of OR
M-WIWI-103278 - Optimization under Uncertainty

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	3

Courses					
ST 2026	2550470	Introduction to Stochastic Optimization	2 SWS	Lecture / 🖥	Rebennack
ST 2026	2550471	Übung zur Einführung in die Stochastische Optimierung	1 SWS	Practice / 🗣	Rebennack, Kandora
ST 2026	2550474	Rechnerübung zur Einführung in die Stochastische Optimierung	2 SWS	Others	Rebennack, Kandora
Exams					
WT 25/26	7900242	Introduction to Stochastic Optimization			Rebennack
ST 2026	7900311	Introduction to Stochastic Optimization			Rebennack

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (60 minutes). The exam takes place in every semester.

Prerequisites
None.

Workload
135 hours

T 7.140 Module component: Investments [T-WIWI-102604]

Coordinators: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101435 - Essentials of Finance

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	1

Courses					
ST 2026	2530575	Investments	2 SWS	Lecture / 🗣	Uhrig-Homburg, Müller
ST 2026	2530576	Übung zu Investments	1 SWS	Practice / 🗣	Uhrig-Homburg, Kargus, Müller
Exams					
WT 25/26	7900054	Investments			Uhrig-Homburg
ST 2026	7900109	Investments			Uhrig-Homburg

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Success is assessed in the form of a written examination (60 minutes). The examination is offered every semester and can be repeated at any regular examination date.

A bonus can be earned for successful participation in the exercises by submitting correct solutions to at least 50% of the bonus exercises set. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

Prerequisites
None

Recommendations
Knowledge of Business Administration: Finance and Accounting [2610026] is recommended.

Below you will find excerpts from courses related to this module component:

V Investments — **Lecture (V) On-Site**
2530575, SS 2026, 2 SWS, Language: German, Open in study portal

Literature
Weiterführende Literatur:

Bodie/Kane/Marcus (2010): Essentials of Investments, 8. Aufl., McGraw-Hill Irwin, Boston

T 7.141 Module component: Laboratory Production Metrology [T-MACH-108878]

Coordinators: Dr.-Ing. Martin Benfer
Prof. Dr.-Ing. Gisela Lanza
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Examination of another type	5 CP	graded	Each summer term	5

Courses					
ST 2026	2150550	Laboratory Production Metrology	3 SWS	Practical course / 🗣	Lanza, Benfer

Legend: 🖥 Online, ❖ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Alternative Test Achievement: Group presentation of 15 min at the beginning of each experiment and evaluation of the participation during the experiments

and

Oral Exam (15 min)

Prerequisites
T-MACH-114827 must not have been started.

Additional Information
The course is offered in German.

For organizational reasons the number of participants for the course is limited. Hence al selection process will take place. Applications are made via the homepage of wbk (http://www.wbk.kit.edu/studium-und-lehre.php).

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Laboratory Production Metrology — **Practical course (P) On-Site**
2150550, SS 2026, 3 SWS, Language: German, Open in study portal

Content

During this course, students get to know measurement systems that are used in a production system. In the age of Industry 4.0, sensors are becoming more important. Therefore, the application of in-line measurement technology such as machine vision and non-destructive testing is focussed. Additionally, laboratory based measurement technologies such as computed tomography are addressed. The students learn the theoretical background as well as practical applications for industrial examples. The students use sensors by themselves during the course. Additionally, they are trained on how to integrate sensors in production processes and how to analyze measurement data with suitable software.

The following topics are addressed:

- Classification and examples for different measurement technologies in a production environment
- Machine vision with optical sensors
- Information fusion based on optical measurements
- Robot-based optical measurements
- Non-destructive testing by means of acoustic measurements
- Coodinate measurement technology
- Industrial computed tomography
- Measurement uncertainty evaluation
- Analysis of production data by means of data mining

Learning Outcomes:

The students ...

- are able to name, describe and mark out different measurement technologies that are relevant in a production environment.
- are able to conduct measurements with the presented in-line and laboratory based measurement systems.
- are able to analyze measurement results and asses the measurement uncertainty of these.
- are able to deduce whether a work piece fulfills quality relevant specifications by analysing measurement results.
- are able to use the presented measurement technologies for a new task.

Workload:

regular attendance: 31,5 hours
self-study: 88,5 hours

Organizational issues

Aus organisatorischen Gründen ist die Teilnehmerzahl für die Lehrveranstaltung begrenzt. Infolgedessen wird ein Auswahlprozess stattfinden. Die Bewerbung erfolgt über die Homepage des wbk (http://www.wbk.kit.edu/studium-und-lehre.php).

For organizational reasons the number of participants for the course is limited. Hence a selection process will take place. Applications are made via the homepage of wbk (KIT - wbk Institute of Production Science Education).

Literature

Skript zur Veranstaltung wird über (https://ilias.studium.kit.edu/) bereitgestellt. Ebenso wird auf gängie Fachliteratur verwiesen.

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/). Additional reference to literature will be provided, as well.

T 7.142 Module component: Large Diesel and Gas Engines for Ship Propulsions [T-MACH-110816]

Coordinators: Dr. German Weisser
Organisation:
Part of: M-MACH-101303 - Combustion Engines II

Type	Credits	Grading	Term offered	Expansion	Version
Oral examination	4 CP	graded	Each summer term	1 semesters	1

Courses					
ST 2026	2134154	Large Diesel and Gas Engines for Ship Propulsions	2 SWS	Lecture / 🗣	Weisser
Exams					
ST 2026	76-T-MACH-110816	Großdiesel- und -gasmotoren für Schiffsantriebe			Weisser

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral exam, 20 minutes

Prerequisites
None

Additional Information
This course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Large Diesel and Gas Engines for Ship Propulsions

2134154, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Organizational issues
ACHTUNG: abweichend von den hier aufgeführten regelmäßigen Mittwoch-Terminen muss die Vorlesung als Blockveranstaltung in KW 30 (Di. bis Fr.) durchgeführt werden. Genaue Informationen entnehmen Sie bitte dem entsprechenden Iliaskurs.

T 7.143 Module component: Learning Factory “Global Production“ [T-MACH-105783]

Coordinators: Prof. Dr.-Ing. Gisela Lanza
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Examination of another type	6 CP	graded	Each winter term	5

Courses					
WT 25/26	2149612	Learning Factory “Global Production“	4 SWS	/ Blended	Lanza
Exams					
WT 25/26	76-T-MACH-105783	Learning Factory "Global Production"			Lanza

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Alternative test achievement (graded):

- Knowledge acquisition in the context of the seminar (4 achievements approx. 20 min each) with weighting 35%.
- Interaction between participants with weighting 20%.
- Scientific colloquium (in groups of 3 students approx. 45 min each) with weighting 45%.

Prerequisites
none

Additional Information
The course is offered in German.

For organisational reasons, the number of participants for the course is limited to 20. As a result, a selection process will take place. Applications must be submitted via the wbk homepage (http://www.wbk.kit.edu/lernfabrik.php).

Due to the limited number of participants, advance registration is required.

Students should have previous knowledge in at least one of the following areas:

- Integrated Production Planning
- Global Production and Logistics
- Quality Management

Workload
180 hours

Below you will find excerpts from courses related to this module component:

V Learning Factory “Global Production“
2149612, WS 25/26, 4 SWS, Language: German, Open in study portal **Blended (On-Site/Online)**

Content

The Learning Factory Global Production serves as a modern teaching environment for the challenges of global production. These challenges are brought to life using the example of electric motor manufacturing under real production conditions. The course is divided into e-learning units and face-to-face sessions. The e-learning units serve to teach essential basics and deepen specific topics (e.g., site selection, Industry 4.0, and production network planning). The face-to-face sessions focus on the case-specific application of relevant methods for planning and controlling global production systems. The Lean & Industry 4.0 unit examines classic methods and tools for designing lean production systems (e.g., Kanban and JIT/JIS, line balancing). A Six Sigma project is used to teach essential methods for quality assurance in complex production systems and to provide practical experience. The “Agile Global Production Networks” unit examines the operation and design of global production networks. Participants are familiarized with the basics of global production and immediately apply the methods they have learned to the assembly of electric motors. The Circular Production module offers insights into the theoretical and practical complexities and solution strategies of remanufacturing.

Main focus of the lecture:

- Site selection
- Lean & Industry 4.0
- Six Sigma 4.0 – Quality management in production
- Agile global production networks
- Circular production

Learning Outcomes:

Students are able to …

- evaluate and select location alternatives using appropriate methods and procedures.
- apply lean management methods and tools to plan and control location-appropriate production systems.
- use the Six Sigma system in a targeted manner and are capable of goal-oriented process management.
- depending on company-specific circumstances, apply methods for planning global production networks, outline a suitable network, and classify and evaluate it based on specific criteria.
- apply methods of circular production and demonstrate how products can be designed for circularity.
- apply the methods and approaches learned for problem solving in a global production environment and reflect on their effectiveness.

Workload:

e-Learning: ~ 36 h
regular attendence: ~ 64 h
self-study: ~ 80 h

Organizational issues

Termine werden über die Institutshomepage bekanntgegeben.

Aus organisatorischen Gründen ist die Teilnehmerzahl für die Lehrveranstaltung auf 20 Teilnehmer begrenzt. Infolgedessen wird ein Auswahlprozess stattfinden. Die Bewerbung erfolgt über die Homepage des wbk (http://www.wbk.kit.edu/studium-und-lehre.php)

Aufgrund der begrenzten Teilnehmerzahl ist eine Voranmeldung erforderlich.

Die Studierenden sollten Vorkenntnisse in mindestens einem der folgenden Bereiche haben:

- Integrierte Produktionsplanung
- Globale Produktion und Logistik
- Qualitätsmanagement

For organisational reasons, the number of participants for the course is limited to 20. As a result, a selection process will take place. Applications must be submitted via the wbk homepage (http://www.wbk.kit.edu/studium-und-lehre.php).

Due to the limited number of participants, advance registration is required.

Students should have previous knowledge in at least one of the following areas:

- Integrated Production Planning
- Global Production and Logistics
- Quality Management

Literature

Medien:

E-Learning Plattform ilias, Powerpoint, Fotoprotokoll. Die Medien werden über ilias (https://ilias.studium.kit.edu/) bereitgestellt.

Media:

E-learning platform ilias, powerpoint, photo protocol. The media are provided through ilias (https://ilias.studium.kit.edu/).

T 7.144 Module component: Logistics and Supply Chain Management [T-WIWI-102870]

Coordinators: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101437 - Industrial Production I

Type	Credits	Grading	Term offered	Version
Written examination	3,5 CP	graded	Each summer term	2

Courses					
ST 2026	2581996	Logistics and Supply Chain Management	2 SWS	Lecture / 🗣	Schultmann, Rudi
Exams					
WT 25/26	7981996	Logistics and Supply Chain Management			Schultmann
ST 2026	7981996	Logistics and Supply Chain Management			Schultmann

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of an oral (30 minutes) or written exam (60 minutes) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Modeled Prerequisites
The following conditions have to be fulfilled:

1. The module component T-MACH-110771 - Logistics and Supply Chain Management must not have been started.

Below you will find excerpts from courses related to this module component:

V Logistics and Supply Chain Management
2581996, SS 2026, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
Students are introduced to the methods and tools of logistics and supply chain management. They students learn the key terms and components of supply chains together with key economic trade-offs. In detail, students gain knowledge of decisions in supply chain management, such as facility location, supply chain planning, inventory management, pricing and supply chain cooperation. In this manner, students will gain knowledge in analyzing, designing and steering of decisions in the domain of logistics and supply chain management.

- Introduction: Basic terms and concepts
- Facility location and network optimization
- Supply chain planning I: flexibility
- Supply chain planning II: forecasting
- Inventory management & pricing
- Supply chain coordination I: the Bullwhip-effect
- Supply chain coordination II: double marginalization
- Supply chain risk management

Literature
Wird in der Veranstaltung bekannt gegeben.

T 7.145 Module component: Machine Tools and High-Precision Manufacturing Systems [T-MACH-110963]

Coordinators: Prof. Dr.-Ing. Jürgen Fleischer
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101286 - Machine Tools and Industrial Handling

Type	Credits	Grading	Term offered	Version
Oral examination	9 CP	graded	Each winter term	2

Courses					
WT 25/26	2149910	Machine Tools and High-Precision Manufacturing Systems	6 SWS	Lecture / Practice / 🗣	Fleischer
Exams					
WT 25/26	76-T-MACH-110963-WING	Machine Tools and High-Precision Manufacturing Systems			Fleischer

Legend: 🖥 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral exam (approx. 45 minutes)

Prerequisites
T-MACH-102158 - Machine Tools and Industrial Handling must not be commenced.
T-MACH-109055 - Machine Tools and Industrial Handling must not be commenced.
T-MACH-110962 - Machine Tools and High-Precision Manufacturing Systems must not be commenced.

Additional Information
The course is offered in German.

Workload
270 hours

Below you will find excerpts from courses related to this module component:

V Machine Tools and High-Precision Manufacturing Systems

2149910, WS 25/26, 6 SWS, Language: German, Open in study portal

Lecture / Practice (VÜ)
On-Site

Content

The lecture gives an overview of the construction, use and application of machine tools and high-precision manufacturing systems. In the course of the lecture a well-founded and practice-oriented knowledge for the selection, design and evaluation of machine tools and high-precision manufacturing systems is conveyed. First, the main components of the systems are systematically explained and their design principles as well as the integral system design are discussed. Subsequently, the use and application of machine tools and high-precision manufacturing systems will be demonstrated using typical machine examples. Based on examples from current research and industrial applications, the latest developments are discussed, especially concerning the implementation of Industry 4.0 and artificial intelligence.
Guest lectures from industry round off the lecture with insights into practice.

The individual topics are:

- Structural components of dynamic manufacturing Systems
- Feed axes: High-precision positioning
- Spindles of cutting machine Tools
- Peripheral Equipment
- Machine control unit
- Metrological Evaluation
- Maintenance strategies and condition Monitoring
- Process Monitoring
- Development process for machine tools and high-precision manufacturing Systems
- Machine examples

Learning Outcomes:

The students …

- are able to assess the use and application of machine tools and high-precision manufacturing systems and to differentiate between them in terms of their characteristics and design.
- can describe and discuss the essential elements of machine tools and high-precision manufacturing systems (frame, main spindle, feed axes, peripheral equipment, control unit).
- are able to select and dimension the essential components of machine tools and high-precision manufacturing systems.
- are capable of selecting and evaluating machine tools and high-precision manufacturing systems according to technical and economic criteria.

Workload:

MACH:
regular attendance: 63 hours
self-study: 177 hours
WING/TVWL:
regular attendance: 63 hours
self-study: 207 hours

Organizational issues

Vorlesungstermine montags und mittwochs, Übungstermine donnerstags.
Bekanntgabe der konkreten Übungstermine erfolgt in der ersten Vorlesung.

Lectures on Mondays and Wednesdays, tutorial on Thursdays.
The tutorial dates will announced in the first lecture.

Zur Vertiefung des im Rahmen der Lehrveranstaltung erworbenen Wissens werden die theoretischen Vorlesungseinheiten durch Praxiseinheiten im Umfeld der Karlsruher Forschungsfabrik (https://www.karlsruher-forschungsfabrik.de) unterstützt.

The theoretical lectures are complemented by practical lectures in the Karlsruhe Research Factory (https://www.karlsruher-forschungsfabrik.de/en.html) to deepen the acquired knowledge.

Literature

Medien:
Skript zur Veranstaltung wird über Ilias (https://ilias.studium.kit.edu/) bereitgestellt.

Media:
Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/).

T 7.146 Module component: Macroeconomic Theory [T-WIWI-109121]

Coordinators: Prof. Dr. Johannes Brumm
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101501 - Economic Theory
M-WIWI-101668 - Economic Policy I
M-WIWI-106472 - Advanced Macroeconomics

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	3

Courses					
WT 25/26	2560404	Macroeconomic Theory	2 SWS	Lecture / 🗣	Brumm, Pegorari
WT 25/26	2560405	Übung zu Macroeconomic Theory	1 SWS	Practice / 🗣	Pegorari
Exams					
WT 25/26	7900264	Macroeconomic Theory			Brumm

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Prerequisites
None.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Macroeconomic Theory

2560404, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
This course introduces a modern approach to macroeconomics by building on microeconomic principles. To be able to rigorously address key macroeconomic questions a general framework based on intertemporal decision making is introduced. Starting by the principles of consumer and firm behavior, this framework is successively expanded by introducing market imperfections, monetary factors as well as international trade. With this framework at hand students are able to analyze labor market policies, government deficits, monetary policy, trade policy, and other important macroeconomic problems. Throughout the course, we not only point out the power of theory but also its limitations.

Literature
Literatur und Skripte werden in der Veranstaltung angegeben.

T 7.147 Module component: Macroeconomics: Theory and Computation [T-WIWI-112735]

Coordinators: Prof. Dr. Johannes Brumm
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-106472 - Advanced Macroeconomics

Type	Credits	Grading	Term offered	Version
Written examination	9 CP	graded	Each term	1

Assessment
The assessment of success takes place in the form of an overall examination of 9 LP on the course Macroeconomic Theory and the course Computational Macroeconomics. The duration of the overall examination is 120 minutes. The examination is offered every semester and can be repeated at any regular examination date.

Additional Information
Teaching and learning format: Lecture and exercise

Workload
270 hours

T 7.148 Module component: Management Accounting 1 [T-WIWI-102800]

Coordinators: Prof. Dr. Marcus Wouters
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101498 - Management Accounting

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	see Annotations	2

Courses					
ST 2026	2579900	Management Accounting 1	2 SWS	Lecture / 🖥	Wouters
ST 2026	2579901	Tutorial Management Accounting 1 (Bachelor)	2 SWS	Practice / 🗣	Dickemann
ST 2026	2579902	Tutorial Management Accounting 1 (Master)	2 SWS	Practice / 🗣	Dickemann
Exams					
WT 25/26	79-2579900-B	Management Accounting 1 (Bachelor)			Wouters
WT 25/26	79-2579900-M	Management Accounting 1 (Mastervorzug und Master)			Wouters

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (120 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Recommendations
We recommend that you take part in our exercise for the lecture.

Additional Information
The course "Management Accounting 1" and the corresponding assessment for first-time examinees will be offered for the last time in the **summer semester 2026**.

The exercise is offered separately for Bachelor's students as well as for students in the Master's transfer and Master's program.

Note for exam registration:

- Bachelor students: 79-2579900-B Management Accounting 1 (Bachelor)
- Students in the Master's transfer and Master's program: 79-2579900-M Management Accounting 1 (Master's transfer and Master)

Below you will find excerpts from courses related to this module component:

V Management Accounting 1

2579900, SS 2026, 2 SWS, Language: English, Open in study portal

Lecture (V)
Online

Content
The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA1 are: short-term planning, investment decisions, budgeting and activity-based costing.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

Learning objectives:

- Students have an understanding of theory and applications of management accounting topics.
- They can use financial information for various purposes in organizations.

Examination:

- The assessment consists of a written exam (120 minutes) at the end of each semester (following § 4 (2) No. 1 of the examination regulation).

Workload:

- The total workload for this course is approximately 135.0 hours. For further information see German version.

Organizational issues
Bitte beachten Sie:
- die Vorlesung Management Accounting 1 wird letztmalig im SoS 2026 und
- die Vorlesung Management Accounting 2 wird letztmalig im WS 2026/27 angeboten.

Literature

- Marc Wouters, Frank H. Selto, Ronald W. Hilton, Michael W. Maher: Cost Management – Strategies for Business Decisions, 2012, Publisher: McGraw-Hill Higher Education (ISBN-13 9780077132392 / ISBN-10 0077132394)
- In addition, several papers that will be available on ILIAS.

V	**Tutorial Management Accounting 1 (Bachelor)** 2579901, SS 2026, 2 SWS, Language: English, Open in study portal	**Practice (Ü)** **On-Site**

Content
see Module Handbook

Organizational issues
Bitte beachten Sie:
- die Übung Management Accounting 1 wird letztmalig im SoS 2026 und
- die Übung Management Accounting 2 wird letztmalig im WS 2026/27 angeboten.

V	**Tutorial Management Accounting 1 (Master)** 2579902, SS 2026, 2 SWS, Language: English, Open in study portal	**Practice (Ü)** **On-Site**

Content
see Module Handbook

Organizational issues
Bitte beachten Sie:
- die Übung Management Accounting 1 wird letztmalig im SoS 2026 und
- die Übung Management Accounting 2 wird letztmalig im WS 2026/27 angeboten.

T 7.149 Module component: Management Accounting 2 [T-WIWI-102801]

Coordinators: Prof. Dr. Marcus Wouters
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101498 - Management Accounting

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	see Annotations	2

Courses					
WT 25/26	2579903	Management Accounting 2	2 SWS	Lecture / Online	Wouters
WT 25/26	2579904	Tutorial Management Accounting 2 (Bachelor)	2 SWS	Practice / On-Site	Letmathe
WT 25/26	2579905	Tutorial Management Accounting 2 (Master)	2 SWS	Practice / On-Site	Letmathe
Exams					
WT 25/26	79-2579903-B	Management Accounting 2 (Bachelor)			Wouters
WT 25/26	79-2579903-M	Management Accounting 2 (Mastervorzug und Master)			Wouters

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
The assessment consists of a written exam (120 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Prerequisites
None

Recommendations
It is recommended:

- to take part in the course "Management Accounting1" before this course
- participation in the exercise for the lecture "Management Accounting 2"

Additional Information
The course "Management Accounting 2" and the corresponding assessment for first-time examinees will be offered for the last time in the **winter semester 2026/2027**.

The exercise for the lecture is offered separately for Bachelor's students as well as for students in the Master's transfer and Master's program.

Note for exam registration: Bachelor students:

- 79-2579903-B Management Accounting 2 (Bachelor)
- Students in the Master's transfer and Master's program: 79-2579903-M Management Accounting 2 (Master's transfer and Master)

Below you will find excerpts from courses related to this module component:

V Management Accounting 2

2579903, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
Online

Content
The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA2 are: cost estimation, product costing and cost allocation, financial performance measures, transfer pricing, strategic performance measurement systems.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

Learning objectives:

- Students have an understanding of theory and applications of management accounting topics. They can use financial information for various purposes in organizations.

Recommendations:

- It is recommended to take part in the course "Management Accounting 1" before this course.

Examination:

- The assessment consists of a written exam (120 min) at the end of each semester (following § 4 (2) No. 1 of the examination regulation).

Workload:

- The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Marc Wouters, Frank H. Selto, Ronald W. Hilton, Michael W. Maher: Cost Management – Strategies for Business Decisions, 2012, Verlag: McGraw-Hill Higher Education (ISBN-13 9780077132392 / ISBN-10 0077132394)
- Zusätzlich werden Artikel auf ILIAS zur Vergügung gestellt.

V **Tutorial Management Accounting 2 (Bachelor)**
2579904, WS 25/26, 2 SWS, Language: English, Open in study portal
Practice (Ü)
On-Site

Content
see ILIAS

V **Tutorial Management Accounting 2 (Master)**
2579905, WS 25/26, 2 SWS, Language: English, Open in study portal
Practice (Ü)
On-Site

Content
see ILIAS

T 7.150 Module component: Management and Marketing [T-WIWI-111594]

Coordinators: Prof. Dr. Martin Klarmann
Prof. Dr. Hagen Lindstädt
Prof. Dr. Petra Nieken
Prof. Dr. Orestis Terzidis

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-105768 - Management and Marketing

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each winter term	2

Courses					
WT 25/26	2600023	Management	2 SWS	Lecture / 🗣	Nieken, Lindstädt, Terzidis
WT 25/26	2610026	Marketing	2 SWS	Lecture / 🗣	Klarmann
Exams					
WT 25/26	7900012	Management and Marketing			Nieken, Terzidis, Klarmann, Lindstädt
ST 2026	7900184	Management and Marketing			Nieken, Terzidis, Klarmann

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written exam (90 min) on the two courses "Management" and "Marketing". The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible at any regular examination date.

Prerequisites
None

Workload
150 hours

Below you will find excerpts from courses related to this module component:

V Marketing
2610026, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Literature
Ausführliche Literaturhinweise werden in den Materialen zur Vorlesung gegeben.

T 7.151 Module component: Managing Organizations [T-WIWI-102630]

Coordinators: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101425 - Strategy and Organization

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	5

Courses					
WT 25/26	2577902	Managing Organizations	2 SWS	Lecture / 🗣	Lindstädt
Exams					
WT 25/26	7900049	Managing Organizations			Lindstädt
ST 2026	7900066	Managing Organizations			Lindstädt

Legend: 🖥 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment will consist of a written exam (60 min) taking place at the beginning of the recess period (according to Section 4 (2), 2 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Managing Organizations

2577902, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

This course enables participants to make a sound assessment of existing organizational structures and regulations. Students learn concepts and models for designing organizational structures, regulating organizational processes, and managing organizational change.

Through intensive exposure to real-world case studies, students are encouraged to learn and apply strategic actions in real-world business settings. The course features an action-oriented approach and provides students with a realistic understanding of the possibilities and limitations of rational design approaches.

Content in Keywords:

- Fundamentals of organizational management: fundamental concepts and theoretical background knowledge
- Management of organizational structures and processes: Corporate headquarters, departmental organization, instruction structure and incentive systems
- Ideal organizational structures: organic vs. mechanistic, Mintzberg's types, relationship to strategy and 7S model
- Management of organizational change (change management): Change processes within an organization, management of revolutionary change

Structure:

Lectures in the course are available to students online as recordings, while class dates are reserved for active discussion of real-world case studies.

Learning Objectives:

Upon completion of the course, students will be able to,

- critically evaluate existing organizational structures and regulations
- compare alternative structural options in a practical setting and evaluate and interpret their effectiveness and efficiency
- analyze and evaluate change processes in organizational management
- apply theoretical knowledge in practical situations

Recommendations:

None.

Workload:

- Total workload for 3.5 credit points: approx. 105 hours
- Attendance time: 30 hours
- Self-study: 75 hours

Competence Certificate:

The assessment of success takes place in the form of a written examination (60min.) (according to §4(2), 1 SPO) at the beginning of the lecture-free period of the semester. The examination is offered every semester and can be repeated at any regular examination date.
A bonus can be earned through successful participation in the exercise. If the grade on the written exam is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the lecture.

Literature

- Laux, H.; Liermann, F.: *Grundlagen der Organisation*, Springer. 6. Aufl. Berlin 2005.
- Lindstädt, H.: *Organisation*, in Scholz, C. (Hrsg.): Vahlens Großes Personallexikon, Verlag Franz Vahlen. 1. Aufl. München, 2009.
- Schreyögg, G.: *Organisation. Grundlagen moderner Organisationsgestaltung*, Gabler. 4. Aufl. Wiesbaden 2003.

Die relevanten Auszüge und zusätzlichen Quellen werden in der Veranstaltung bekannt gegeben.

T 7.152 Module component: Managing the Marketing Mix [T-WIWI-102805]

Coordinators: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101424 - Foundations of Marketing

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each summer term	2

Courses					
ST 2026	2571152	Managing the Marketing Mix	2 SWS	Lecture / 🗣	Klarmann
ST 2026	2571153	Übung zu Marketing Mix (Bachelor)	1 SWS	Practice / 🗣	Daumann, Weber
Exams					
WT 25/26	7900061	Managing the Marketing Mix			Klarmann
ST 2026	7900023	Managing the Marketing Mix			Klarmann

Legend: 📱 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment of success takes place through the preparation and presentation of a case study (max. 30 points) as well as a written exam with additional aids in the sense of an open book exam (max. 60 points). In total, a maximum of 90 points can be achieved in the course. Further details will be announced during the lecture.

Prerequisites
None

Additional Information
The course is compulsory in the module "Foundations of Marketing".
For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Managing the Marketing Mix

2571152, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The content of this course concentrates on the elements of the marketing mix. Therefore the main chapters are brand management, pricing, promotion and sales management.

For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

This course is compulsory within or the module "Foundations of Marketing" and must be examined.

Learning objectives:

student

- know the meaning of the branding, the brand positioning and the possibilities of the brand value calculation
- understand the price behavior of customers and can apply this knowledge to the practice
  know different methods for price determination (conjoint analysis, cost-plus determination, target costing, customer surveys, bidding procedures) and price differentiation
- are able to name and explain the relevant communication theories
- can identify crisis situations and formulate appropriate response strategies
- can name and judge different possibilities of the Intermediaplanung
- know various design elements of advertising communication
- understand the measurement of advertising impact and can apply it
- know the basics of sales organization
- are able to evaluate basic sales channel decisions

Workload:

The total workload for this course is approximately 135.0 hours.

Literature
Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.

T 7.153 Module component: Manufacturing Measurement Technology [T-ETIT-106057]

Coordinators: Prof. Dr.-Ing. Michael Heizmann
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-106581 - Measurement, Control, and Manufacturing Measurement Technology

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each summer term	1

Courses					
ST 2026	2302116	Manufacturing Measurement Technology	2 SWS	Lecture / ⚙	Heizmann, Schmerbeck
Exams					
WT 25/26	7302116	Manufacturing Measurement Technology			Heizmann

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

T 7.154 Module component: Material Flow in Production and Logistics [T-MACH-112968]

Coordinators: Prof. Dr.-Ing. Kai Furmans
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106995 - Automation and Material Flow in Logistics

Type	Credits	Grading	Term offered	Expansion	Version
Oral examination	4,5 CP	graded	Each summer term	1 semesters	4

Courses					
ST 2026	2118181	Material flow in production and logistics	3 SWS	Lecture / Blended	Furmans
Exams					
ST 2026	76-T-MACH-112968	Material Flow in Production and Logistics			Furmans

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
The assessment consists of an oral exam (approx. 20 min.) taking place in the recess period according to § 4 paragraph 2 Nr. 2 of the examination regulation.

Prerequisites
none

Recommendations
none

Additional Information
The course is offered in German.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Material flow in production and logistics
2118181, SS 2026, 3 SWS, Language: German, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Content

Course content:

- Material flow elements (conveyor line, branch, merge)
- Description of networked Material Flow models with graphs, matrices, etc.
- Queueing theory: Calculation of waiting times, utilisation rates, etc.
- Storage and picking
- Shuttle systems, automated storage and retrieval systems
- Value stream analysis
- Lean manufacturing topics

Learning objectives:

After successfully completing the course, you will be able to do the following independently and as part of a team:

- Describe a material flow system accurately in a conversation with experts.
- Model and parameterise the system load and the typical material flow elements.
- Design a material flow system for a specific task.
- Set the performance of a system depending on the requirements.
- Conceptually expand the limits of today's methods and system components as needed.

Description:

The course is divided into 6 thematic blocks, each of which is divided into the following phases and dates:

Off-campus:

- self-study
- exercise

On-campus:

- classroom sessions with practical application

Organizational issues

vorläufige Termine: (Doppelblock, 7 Mal im Semester)

- 22.04.2026 (13:30–16:00): Einführungsveranstaltung
- 29.04.2026 (13:00–15:30): Themenblock 1
- 06.05.2026 (14:00–16:30): Themenblock 2
- 20.05.2026 (13:00–15:30): Themenblock 3
- 03.06.2026 (14:00–16:30): Themenblock 4 & 5.1
- 24.06.2026 (13:00–15:30): Themenblock 5.2
- 08.07.2026 (14:00–16:30): Fragestunde
- 15.07.2026 (14:00–16:30): Ausweichtermin

Ort: IFL (Selmayr-Hörsaal)

Anmerkungen: Im Rahmen des Inverted Classroom Modells erfolgt die Vermittlung der theoretischen Inhalte sowie der Übungen vollständig online. Die Präsenzveranstaltungen auf dem Campus dienen ausschließlich dazu, das erlernte Wissen in realitätsnahen Szenarien praktisch anzuwenden.

Erfolgskontrolle: Die Erfolgskontrolle erfolgt in Form einer Prüfungsleistung anderer Art. Die Bewertung setzt sich aus einer mündlichen Prüfung und der regelmäßigen und aktiven Teilnahme an den Kursterminen zusammen.

Empfehlungen:

- (von Vorteil): Statistische Grundkenntnisse und –verständnis.
- (von Vorteil): Kenntnisse in einer gängigen Programmiersprache (Java, Python, …).

Literature

Arnold, Dieter; Furmans, Kai: Materialfluss in Logistiksystemen; Springer-Verlag Berlin Heidelberg, 7. Auflage 2019

T 7.155 Module component: Material Science II for Business Engineers [T-MACH-102079]

Coordinators: Dr.-Ing. Susanne Wagner
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101261 - Emphasis in Fundamentals of Engineering
M-MACH-101262 - Emphasis Materials Science
M-WIWI-101839 - Additional Fundamentals of Engineering

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each summer term	1

Courses					
ST 2026	2126782	Materials Science II for Industrial Engineers	2 SWS	Lecture / 🗣	Wagner
Exams					
WT 25/26	76-T-MACH-102079	Material Science II			Pagnan Furlan, Wagner
ST 2026	76-T-MACH-102079	Material Science II for Business Engineers			Wagner

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written examination (150 min) taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination takes place every semester. Re-examinations are offered at every ordinary examination date. The examination at the end of the winter term is carried out by a written or oral exam.

Prerequisites
The module *Material Science* has to be completed beforehand.

Workload
150 hours

Below you will find excerpts from courses related to this module component:

V Materials Science II for Industrial Engineers

2126782, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Literature
Weiterführende Literatur:

- Werkstoffwissenschaften - Eigenschaften, Vorgänge, Technologien, B. Ilscher, Springer – Verlag, Berlin Heidelberg New York, ISBN 3-540-10725-5
- Werkstoffwissenschaften, Schatt, Werner / Worch, Hartmut (Hrsg.) Wiley-VCH, Weinheim, ISBN-10: 3-527-30535-1
- Metallkunde für das Maschinenwesen I/II, K.G. Schmitt-Thomas, Springer-Verlag, ISBN 3-540-51913-0
- Materials Science and Engineering – An Introduction, William D. Callister (Jr.), John Wiley & Son, ISBN-10: 978-0-471-73696-7

T 7.156 Module component: Materials Science I [T-MACH-102078]

Coordinators: Dr.-Ing. Susanne Wagner
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101260 - Materials Science

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each winter term	1

Courses					
WT 25/26	2125760	Materials Science I	2 SWS	Lecture / 🔀	Pagnan Furlan, Wagner
Exams					
WT 25/26	76-T-MACH-102078	Materials Science I			Wagner, Pagnan Furlan
ST 2026	76-T-MACH-102078	Materials Science I			Wagner, Pagnan Furlan

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
The assessment consists of a written examination (150 min) taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination takes place every semester. Re-examinations are offered at every ordinary examination date. The examination at the end of the summer term is carried out by a written or oral exam.

Prerequisites
None

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V Materials Science I
2125760, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Literature
Weiterführende Literatur:

Werkstoffwissenschaften - Eigenschaften, Vorgänge, Technologien, B. Ilscher, Springer – Verlag, Berlin Heidelberg New York, ISBN 3-540-10725-5
Werkstoffwissenschaften, Schatt, Werner / Worch, Hartmut (Hrsg.) Wiley-VCH, Weinheim, ISBN-10: 3-527-30535-1
Metallkunde für das Maschinenwesen I/II, K.G. Schmitt-Thomas, Springer-Verlag, ISBN 3-540-51913-0
Materials Science and Engineering – An Introduction, William D. Callister (Jr.), John Wiley & Son, ISBN-10: 978-0-471-73696-7 .

T 7.157 Module component: Mathematical Methods in Hydraulics [T-MACH-113912]

Coordinators: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-101266 - Automotive Engineering
M-MACH-101267 - Mobile Machines

Type	Credits	Grading	Term offered	Expansion	Version
Oral examination	4 CP	graded	Each term	1 semesters	3

Courses					
WT 25/26	2113090	Mathematical Methods of Fluid Power	2 SWS	Lecture / 🗣	Geimer
Exams					
WT 25/26	76-T-MACH-113912	Mathematical Methods in Hydraulics			Geimer

Legend: 🖥 Online, ♲ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral examination, duration approx. 30min

Prerequisites
T-MACH-113913 - Exercises for Mathematical Methods of Fluid Power must be passed.

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Mathematical Methods of Fluid Power

2113090, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

- Fundamentals of hydraulics,
- Description of components for converting mechanical energy into hydraulic energy and vice versa (pumps and motors),
- Presentation of components for controlling pressure and volume flow (pressure and flow valves)
- Illustration and description of hydraulic systems
- Solution methods for the pressure curve over time
- Simulation approaches for hydraulic networks

T 7.158 Module component: Mathematics I - Final Exam [T-MATH-111493]

Coordinators: Prof. Dr. Daniel Hug
Prof. Dr. Günter Last
Dr. Franz Nestmann
PD Dr. Steffen Winter

Organisation: KIT Department of Mathematics

Part of: M-MATH-105754 - Mathematics 1

Type	Credits	Grading	Version
Written examination	5 CP	graded	1

Exams			
WT 25/26	00027	Mathematics I - Final Exam	Nestmann, Last, Winter
ST 2026	7700050	Mathematics I - Final Exam	Winter, Nestmann, Last

7.159 Module component: Mathematics I - Midterm Exam [T-MATH-111492]

Coordinators: Prof. Dr. Daniel Hug
Prof. Dr. Günter Last
Dr. Franz Nestmann
PD Dr. Steffen Winter

Organisation: KIT Department of Mathematics

Part of: M-MATH-105754 - Mathematics 1

Type	Credits	Grading	Version
Written examination	5 CP	graded	1

Exams			
WT 25/26	00070	Mathematics I - Midterm Exam	Nestmann, Last, Winter
ST 2026	7700053	Mathematics I - Midterm Exam	Winter, Nestmann, Last

T 7.160 Module component: Mathematics II - Final Exam [T-MATH-111496]

Coordinators: Prof. Dr. Daniel Hug
Prof. Dr. Günter Last
Dr. Franz Nestmann
PD Dr. Steffen Winter

Organisation: KIT Department of Mathematics

Part of: M-MATH-105756 - Mathematics 2

Type	Credits	Grading	Version
Written examination	3,5 CP	graded	1

Exams			
WT 25/26	00021	Mathematics II - Final Exam	Nestmann, Winter, Last

T 7.161 Module component: Mathematics II - Midterm Exam [T-MATH-111495]

Coordinators: Prof. Dr. Daniel Hug
Prof. Dr. Günter Last
Dr. Franz Nestmann
PD Dr. Steffen Winter

Organisation: KIT Department of Mathematics

Part of: M-MATH-105756 - Mathematics 2

Type	Credits	Grading	Version
Written examination	3,5 CP	graded	1

Exams			
WT 25/26	00020	Mathematics II - Midterm Exam	Nestmann, Winter, Last

T 7.162 Module component: Mathematics III - Final Exam [T-MATH-111498]

Coordinators: Prof. Dr. Daniel Hug
Prof. Dr. Günter Last
Dr. Franz Nestmann
PD Dr. Steffen Winter

Organisation: KIT Department of Mathematics

Part of: M-MATH-105757 - Mathematics 3

Type	Credits	Grading	Version
Written examination	4 CP	graded	1

Exams			
WT 25/26	6700051	Mathematics III - Final Exam	Nestmann, Winter, Last
ST 2026	7700064	Mathematics III - Final Exam	Winter, Last, Nestmann

T 7.163 Module component: Measurement and Control Technology [T-ETIT-112852]

Coordinators: Prof. Dr.-Ing. Michael Heizmann
Prof. Dr.-Ing. Sören Hohmann

Organisation: KIT Department of Electrical Engineering and Information Technology

Part of: M-ETIT-106581 - Measurement, Control, and Manufacturing Measurement Technology

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	6 CP	graded	Each summer term	1 semesters	1

Courses					
ST 2026	2302300	Measurement and Control Technology	2 SWS	Lecture / 🗣	Heizmann, Hohmann, Piscol, Baßler
ST 2026	2302301	Practice to 2302300 Measurement and Control Technology	2 SWS	Practice / 🗣	Heizmann, Hohmann, Piscol, Baßler
Exams					
WT 25/26	7302300	Measurement and Control Technology			Hohmann, Heizmann

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment of success takes place in the form of a written examination lasting 120 minutes. The module grade is the grade of the written examination.

Prerequisites
none

Recommendations
Kenntnisse aus „Signale und Systeme“ sind hilfreich.

T 7.164 Module component: Mechanical Design A [T-MACH-112984]

Coordinators: Prof. Dr.-Ing. Tobias Düser
Prof. Dr.-Ing. Sven Matthiesen

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106527 - Mechanical Design A

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	7 CP	graded	Each winter term	1 semesters	2

Courses					
WT 25/26	2145170	Mechanical Design A	3 SWS	Lecture / 🗣	Matthiesen, Düser
WT 25/26	2145194	Tutorial for Mechanical Design A	1 SWS	Practice / 🗣	Matthiesen, Düser
Exams					
WT 25/26	76-T-MACH-112984	Mechanical Design A			Matthiesen, Düser
ST 2026	76-T-MACH-112984	Mechanical Design A			Matthiesen, Düser

Legend: 🖥 Online, ⚄ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written exam with a duration of 90 Minutes

Prerequisites
Admission to the exam only with succesful completion of Workshop Mechanical Design A (T-MACH-112981)

Recommendations
None

Additional Information
Students are familiar with the basic machine elements of technical systems and are able to analyze them in a system context

The course is offered in German.

Workload
180 hours

Below you will find excerpts from courses related to this module component:

V Mechanical Design A

2145170, WS 25/26, 3 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
Students are introduced to fundamental topics in Mechanical Design A. The focus is on the analysis of existing systems and the development of knowledge for fundamental elements and functionality of technical systems. The course is divided into the following topics:

- Springs
- Technical systems
- Bearings
- Seals
- Component connection
- Gearbox

Literature
Alle genannten Bücher können über die KIT-Bibliothek in physischer Form oder als eBook eingesehen/bezogen werden.

- Konstruktionselemente des Maschinenbaus 1 - Grundlagen der Berechnung und Gestaltung von Maschinenelementen; Steinhilper, Sauer; Springer Verlag, ISBN 978-3-662-66822-1 oder eBook ISBN 978-662-66823-8
- Konstruktionselemente des Maschinenbaus 2 - Grundlagen von Maschinenelementen für Antriebsaufgaben; Steinhilper, Sauer; Springer Verlag, ISBN 978-3-662-67013-2 oder eBook ISBN 978-3-662-67014-9
- Technisches Zeichnen: Grundlagen, Normen, Beispiele, Darstellende Geometrie; Hoischen, Hans; Cornelson, ISBN 978-3-064-52361-6

V **Tutorial for Mechanical Design A**
2145194, WS 25/26, 1 SWS, Language: German, Open in study portal

Practice (Ü)
On-Site

Content
Specific applications and tasks in the subject areas of MKL A:

- Springs
- Technical systems
- Bearings
- Seals
- Component connection
- Gearbox

Literature
Alle genannten Bücher können über die KIT-Bibliothek in physischer Form oder als eBook eingesehen/bezogen werden.

- Konstruktionselemente des Maschinenbaus 1 - Grundlagen der Berechnung und Gestaltung von Maschinenelementen; Steinhilper, Sauer; Springer Verlag, ISBN 978-3-662-66822-1 oder eBook ISBN 978-662-66823-8
- Konstruktionselemente des Maschinenbaus 2 - Grundlagen von Maschinenelementen für Antriebsaufgaben; Steinhilper, Sauer; Springer Verlag, ISBN 978-3-662-67013-2 oder eBook ISBN 978-3-662-67014-9
- Technisches Zeichnen: Grundlagen, Normen, Beispiele, Darstellende Geometrie; Hoischen, Hans; Cornelson, ISBN 978-3-064-52361-6

T 7.165 Module component: Mechanical Design A, Workshop [T-MACH-112981]

Coordinators: Prof. Dr.-Ing. Tobias Düser
Prof. Dr.-Ing. Sven Matthiesen

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106527 - Mechanical Design A

Type	Credits	Grading	Term offered	Expansion	Version
Coursework	2 CP	pass/fail	Each winter term	1 semesters	2

Courses					
WT 25/26	2145171	Mechanical Design A - Workshop	1 SWS	Practical course / 🗣	Matthiesen, Düser
Exams					
WT 25/26	76-T-MACH-112981	Mechanical Design A, Workshop			Düser, Matthiesen

Legend: 📱 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Concomitant to the lecture, a workshop with 3 workshop sessions takes place over the semester. During the workshop the students are divided into groups and their mechanical design knowledge will be tested during a colloquium at the beginning of every single workshop session. The attendance is mandatory and will be controlled.

The pass of the colloquia and the process of the workshop task are required for the successful participation.

Prerequisites
None

Recommendations
None

Additional Information
The course is offered in German.

Workload
60 hours

Below you will find excerpts from courses related to this module component:

V Mechanical Design A - Workshop

2145171, WS 25/26, 1 SWS, Language: German, Open in study portal

Practical course (P)
On-Site

Content
In addition to the MD A lecture, the students are familiarized with the design process in a series of three workshops. The focus here is on application-oriented learning and understanding. For example, the students independently disassemble and assemble small demonstrator systems and thus gain a better understanding of the relevant problems in the field of mechanical design.

Organizational issues
Dauer eines Workshop Slots: 1,5 h (Informationen zu den Terminen und der Anmeldung im MKL A ILIAS Kurs)

Literature
Alle genannten Bücher können über die KIT-Bibliothek in physischer Form oder als eBook eingesehen/bezogen werden.

- Konstruktionselemente des Maschinenbaus 1 - Grundlagen der Berechnung und Gestaltung von Maschinenelementen; Steinhilper, Sauer; Springer Verlag, ISBN 978-3-662-66822-1 oder eBook ISBN 978-662-66823-8
- Konstruktionselemente des Maschinenbaus 2 - Grundlagen von Maschinenelementen für Antriebsaufgaben; Steinhilper, Sauer; Springer Verlag, ISBN 978-3-662-67013-2 oder eBook ISBN 978-3-662-67014-9
- Technisches Zeichnen: Grundlagen, Normen, Beispiele, Darstellende Geometrie; Hoischen, Hans; Cornelson, ISBN 978-3-064-52361-6

T 7.166 Module component: Mechatronical Systems and Products [T-MACH-112647]

Coordinators: Prof. Dr.-Ing. Sören Hohmann
Prof. Dr.-Ing. Sven Matthiesen

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106236 - Mechatronic Product Design

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	graded	Each winter term	2

Courses					
ST 2026	2303003	Exercises for 2303161 Mechatronical Systems and Products	1 SWS	Practice / 🗣	Matthiesen, Hohmann, Teltschik
ST 2026	2303161	Mechatronical Systems and Products	2 SWS	Lecture / 🧩	Matthiesen, Hohmann
Exams					
WT 25/26	76-T-MACH-105574	Mechatronical Systems and Products			Matthiesen

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, x Cancelled

Assessment
written exam (60 min)

Additional Information
The course is offered in German.

Workload
120 hours

T 7.167 Module component: Metal Forming [T-MACH-105177]

Coordinators: Prof. Dr.-Ing. Thomas Herlan
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each summer term	2

Courses					
ST 2026	2150681	Metal Forming	2 SWS	Lecture / 🗣	Herlan
Exams					
WT 25/26	76-T-MACH-105177	Metal Forming			Herlan

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral Exam (20 min)

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V **Metal Forming** — **Lecture (V) On-Site**
2150681, SS 2026, 2 SWS, Language: German, Open in study portal

Content

At the beginning of the lecture the basics of metal forming are briefly introduced. The focus of the lecture is on massive forming (forging, extrusion, rolling) and sheet forming (car body forming, deep drawing, stretch drawing). This includes the systematic treatment of the appropriate metal forming Machines and the corresponding tool technology. Aspects of tribology, as well as basics in material science and aspects of production planning are also discussed briefly. The plastic theory is presented to the extent necessary in order to present the numerical simulation method and the FEM computation of forming processes or tool design. The lecture will be completed by product samples from the forming technology.

The topics are as follows:

- Introduction and basics
- Hot forming
- Metal forming machines
- Tools
- Metallographic fundamentals
- Plastic theory
- Tribology
- Sheet forming
- Extrusion
- Numerical simulation
- Sustainability in forming technology
- I4.0 and AI applications
- Production planning and quality assurance

Learning Outcomes:

The students …

- are able to reflect the basics, forming processes, tools, Machines and equipment of metal forming in an integrated and systematic way.
- are capable to illustrate the differences between the forming processes, tools, machines and equipment with concrete examples and are qualified to analyze and assess them in terms of their suitability for the particular application.
- are also able to transfer and apply the acquired knowledge to other metal forming problems.

Workload:

regular attendance: 21 hours
self-study: 99 hours

Organizational issues

Vorlesungstermine freitags, wöchentlich.
Die konkreten Termine werden in der ersten Vorlesung bekannt gegeben und auf der Institutshomepage und ILIAS veröffentlicht.

Zur Vertiefung des im Rahmen der Lehrveranstaltung erworbenen Wissens werden die theoretischen Vorlesungseinheiten durch Praxiseinheiten im Umfeld der Karlsruher Forschungsfabrik (https://www.karlsruher-forschungsfabrik.de) unterstützt.

The theoretical lectures are complemented by practical lectures in the Karlsruhe Research Factory (https://www.karlsruher-forschungsfabrik.de/en.html) to deepen the acquired knowledge.

Literature

Medien:
Skript zur Veranstaltung wird über (https://ilias.studium.kit.edu/) bereitgestellt.

Media:
Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/)

T 7.168 Module component: Microactuators [T-MACH-101910]

Coordinators: Prof. Dr. Manfred Kohl
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101287 - Microsystem Technology

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each summer term	3

Courses					
ST 2026	2142881	Microactuators	2 SWS	Lecture / 🗣	Kohl
Exams					
ST 2026	76-T-MACH-101910	Microactuators			Kohl
ST 2026	76T-MACH-101910_2	Microactuators			Kohl

Legend: 🖥 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
written exam, 60 min.

Prerequisites
T-MACH-114036 must not be started

Additional Information
The course is offered in German

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Microactuators

2142881, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
- Basic knowledge in the material science of the actuation principles
- Layout and design optimization
- Fabrication technologies
- Selected developments
- Applications

The lecture includes amongst others the following topics:

- Microelectromechnical systems: linear actuators, microrelais, micromotors
- Medical technology and life sciences: Microvalves, micropumps, microfluidic systems
- Microrobotics: Microgrippers, polymer actuators (smart muscle)
- Information technology: Optical switches, mirror systems, read/write heads

Literature
- Folienskript "Mikroaktorik"

- D. Jendritza, Technischer Einsatz Neuer Aktoren: Grundlagen, Werkstoffe, Designregeln und Anwendungsbeispiele, Expert-Verlag, 3. Auflage, 2008

- M. Kohl, Shape Memory Microactuators, M. Kohl, Springer-Verlag Berlin, 2004

- N.TR. Nguyen, S.T. Wereley, Fundamentals and applications of Microfluidics, Artech House, Inc. 2002

- H. Zappe, Fundamentals of Micro-Optics, Cambride University Press 2010

T 7.169 Module component: Microeconometrics [T-WIWI-112153]

Coordinators: Prof. Dr. Fabian Krüger
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101599 - Statistics and Econometrics
M-WIWI-105414 - Statistics and Econometrics II

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Irregular	1

Courses					
ST 2026	2500019	Tutorial in Microeconometrics	2 SWS	Practice / 🗣	Krüger
ST 2026	2500032	Microeconometrics	2 SWS	Lecture / 🗣	Krüger

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written examination (90 minutes) according to § 4(2), 1 of the examination regulation.

A bonus can be acquired by successful completion of an assignment (written report + short in-class presentation) during the semester. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4).

Prerequisites
None

Recommendations
Students are expected to have a good working knowledge of the linear regression model (e.g. by having attended the course `Volkswirtschaftslehre III: Einführung in die Ökonometrie', or attending it in the same semester as `Microeconometrics').

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Microeconometrics
2500032, SS 2026, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
Microeconometrics is concerned with modeling data from an individual (`micro') unit like a person, household or firm. The response variables of interest are often discrete. For example, a person's type of employment may be coded as a binary variable (e.g. working in IT sector versus not working in IT sector), and a person's choice of transportation mode can be cast as a multinomial variable (e.g. bike, train, car, or other). These dependent variables often require nonlinear regression modeling.

The course first introduces maximum likelihood estimation which is particularly useful in microeconometrics. We then discuss econometric models for various types of response variables, as well as methods for estimation and model evaluation. Throughout the course, implementation via R software plays an important role.

Prerequisites: Course participants are expected to have a good working knowledge of the linear regression model (e.g. by having attended the course `Einführung in die Ökonometrie', or attending it in the same semester as `Microeconometrics').

Literature
Winkelmann, R., Boes, S. (2006): Analysis of Microdata. Springer.

T 7.170 Module component: Mobile Machines [T-MACH-105168]

Coordinators: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101267 - Mobile Machines

Type	Credits	Grading	Term offered	Version
Oral examination	8 CP	graded	Each summer term	3

Courses					
ST 2026	2114073	Mobile Machines	4 SWS	Lecture / 🗣	Geimer
Exams					
WT 25/26	76T-MACH-105168	Mobile Machines			Geimer
ST 2026	76-T-MACH-105168	Mobile Machines			Geimer

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of an oral exam (45 min) taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
none

Recommendations
Knowledge of the mathematical method of hydraulics is assumed. Prior attendance of the course "Mathematical Methods of Hydraulics"[2113090] is recommended.

Additional Information
Learning objectives:

After successful participation in the course:

- the student will be able to name the wide range of mobile machinery
- know the possible applications and operating sequences of the most important mobile machines
- be able to describe selected subsystems and components

Content:

- Presentation of the components used and the most important mobile machines
- Basics and structure of the machines
- Practical insights into the development of the machines

Media:

Downloadable set of slides for the lecture

Book "Grundlagen mobiler Arbeitsmaschinen", Karlsruhe series of publications on vehicle systems technology, Volume 22, KIT Scientific Publishing

The course is offered in German.

Workload
240 hours

Below you will find excerpts from courses related to this module component:

V **Mobile Machines** **Lecture (V)**
2114073, SS 2026, 4 SWS, Language: German, Open in study portal **On-Site**

Content

- Introduction of the required components and machines
- Basics of the structure of the whole system
- Practical insight in the development techniques

Knowledge in Fluid Power is required.

Recommendations:

It is recommended to attend the course *Fluid Power* [2113092] or *Mathematische Methoden der Hydraulik* [2113090] beforehand.

- regular attendance: 42 hours
- self-study: 184 hours

T 7.171 Module component: Mobility and Infrastructure [T-BGU-101791]

Coordinators: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101067 - Mobility and Infrastructure

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	9 CP	graded	Each term	1 semesters	2

Courses					
ST 2026	6200404	Spatial Planning and Planning Law	2 SWS	Lecture / 🔄	Wilske
ST 2026	6200405	Exercises to Spatial Planning and Planning Law	1 SWS	Practice / 🗣	Wilske, Mitarbeiter/innen
ST 2026	6200406	Transportation Systems	2 SWS	Lecture / 🗣	Vortisch
ST 2026	6200407	Exercises to Transportation Systems	1 SWS	Practice / 🗣	Vortisch, Mitarbeiter/innen
ST 2026	6200408	Design Basics in Highway Engineering	2 SWS	Lecture / 🗣	Zimmermann, Stelzenmüller
ST 2026	6200409	Exercises to Design Basics in Highway Engineering	1 SWS	Practice / 🗣	Zimmermann, Stelzenmüller
Exams					
WT 25/26	8234101791	Mobility and Infrastructure			Vortisch

Legend: 🖥 Online, 🔄 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
written exam, 150 min.

Prerequisites
None

Recommendations
For students from the KIT-Department of Economics and Management it is recommended to take part in the excercises.

Additional Information
none

Workload
275 hours

T 7.172 Module component: Modeling and OR-Software: Introduction [T-WIWI-106199]

Coordinators: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101413 - Applications of Operations Research

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	4

Courses					
ST 2026	2550490	Modellieren und OR-Software: Einführung	3 SWS	Practical course / Blended	Nickel, Linner, Pomes
Exams					
WT 25/26	7900081	Modeling and OR-Software: Introduction			Nickel
ST 2026	7900153	Modeling and OR-Software: Introduction			Nickel

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
The assessment is a written examination (60 min.). The successful completion of the exercises is required for admission to the written exam.
The examination is held in every semester

Recommendations
Firm knowledge of the contents from the lecture *Introduction to Operations Research I* [2550040] of the module *Operations Research*.

Additional Information
Due to capacity restrictions, registration before course start is required. For further information, see the webpage of the course. Registration is possible in the Wiwi portal. The lecture is offered in every term. The planned lectures and courses for the next three years are announced online at https://dol.ior.kit.edu/Lehrveranstaltungen.php.
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Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Modellieren und OR-Software: Einführung

2550490, SS 2026, 3 SWS, Language: German, Open in study portal

Practical course (P)
Blended (On-Site/Online)

Content
After an introduction to general concepts of modelling tools (implementation, data handling, result interpretation, ...) CPLEX in combination with Python will be discussed which can be used to solve OR problems on a computer-aided basis. Subsequently, a broad range of exercises will be discussed. The main goals of the exercises from literature and practical applications are to learn the process of modeling optimization problems as linear or mixed-integer programs, to efficiently utilize the presented tools for solving these optimization problems and to implement heuristic solution procedures for mixed-integer programs.

Organizational issues
Die Teilnehmerzahl für diese Veranstaltung ist begrenzt.

Die Bewerbung erfolgt über das Wiwi-Portal.

Die Nachklausur zu dieser Veranstaltung wird nur für Nachschreibende angeboten.

7.173 Module component: Nonlinear Optimization I [T-WIWI-102724]

Coordinators: Prof. Dr. Oliver Stein
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101414 - Methodical Foundations of OR
M-WIWI-103278 - Optimization under Uncertainty

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	4

Courses					
WT 25/26	2550111	Nonlinear Optimization I	2 SWS	Lecture / 🗣	Stein
WT 25/26	2550112	Exercises Nonlinear Optimization I	1 SWS	Practice / 🗣	Stein, Schwarze, Neussel
Exams					
WT 25/26	7900001_WS2526_HK	Nonlinear Optimization I			Stein
ST 2026	7900202_SS2026_NK	Nonlinear Optimization I			Stein

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The successful completion of the exercises is required for admission to the written exam. The exam takes place in the semester of the lecture and in the following semester.
The examination can also be combined with the examination of Nonlinear Optimization II [2550113]. In this case, the duration of the written examination takes 120 minutes.

Prerequisites

The module component exam T-WIWI-103637 "Nonlinear Optimization I and II" may not be selected.

Additional Information

Part I and II of the lecture are held consecutively in the *same* semester.

Below you will find excerpts from courses related to this module component:

V Nonlinear Optimization I

2550111, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content

The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality condtions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of optimization problems *with* constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

Learning objectives:

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

Literature

O. Stein, Basic Concepts of Nonlinear Optimization, Springer, Berlin, 2024

Additional Literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T 7.174 Module component: Nonlinear Optimization I and II [T-WIWI-103637]

Coordinators: Prof. Dr. Oliver Stein
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101414 - Methodical Foundations of OR

Type	Credits	Grading	Term offered	Version
Written examination	9 CP	graded	Each winter term	6

Courses					
WT 25/26	2550111	Nonlinear Optimization I	2 SWS	Lecture / 🗣	Stein
WT 25/26	2550112	Exercises Nonlinear Optimization I	1 SWS	Practice / 🗣	Stein, Schwarze, Neussel
WT 25/26	2550113	Nonlinear Optimization II	2 SWS	Lecture / 🗣	Stein
Exams					
WT 25/26	7900003_WS2526_HK	Nonlinear Optimization I and II			Stein
ST 2026	7900204_SS2026_NK	Nonlinear Optimization I and II			Stein

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consits of a written exam in English (120 minutes) according to Section 4(2), 1 of the examination regulation. The successful completion of the exercises is required for admission to the written exam.

The exam takes place in the semester of the lecture and in the following semester.

Prerequisites
None.

Additional Information
Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from courses related to this module component:

V Nonlinear Optimization I
2550111, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality condtions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of optimization problems *with* constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester.*

Learning objectives:

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

Literature
O. Stein, Basic Concepts of Nonlinear Optimization, Springer, Berlin, 2024

Additional Literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

V **Nonlinear Optimization II**
2550113, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions
- Algorithms (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of optimization problems *without* constraints forms the contents of the lecture "Nonlinear Optimization I". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester.*

Learning objectives:

The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.

Literature
O. Stein, Basic Concepts of Nonlinear Optimization, Springer, Berlin, 2024

Additional Literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T 7.175 Module component: Nonlinear Optimization II [T-WIWI-102725]

Coordinators: Prof. Dr. Oliver Stein
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101414 - Methodical Foundations of OR

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	3

Courses					
WT 25/26	2550112	Exercises Nonlinear Optimization I	1 SWS	Practice / 🗣	Stein, Schwarze, Neussel
WT 25/26	2550113	Nonlinear Optimization II	2 SWS	Lecture / 🗣	Stein
WT 25/26	2550114	Exercise to Nonlinear Optimization II	1 SWS	Practice / 🗣	Stein, Schwarze, Neussel
Exams					
WT 25/26	7900002_WS2526_HK	Nonlinear Optimization II			Stein
ST 2026	7900203_SS2026_NK	Nonlinear Optimization II			Stein

Legend: 🖥 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consits of a written exam (60 minutes) in English according to Section 4(2), 1 of the examination regulation. The successful completion of the exercises is required for admission to the written exam.

The exam takes place in the semester of the lecture and in the following semester.

The exam can also be combined with the examination of *Nonlinear Optimization I* [2550111]. In this case, the duration of the written exam takes 120 minutes.

Prerequisites
None.

Additional Information
Part I and II of the lecture are held consecutively in the same semester.

Below you will find excerpts from courses related to this module component:

V Nonlinear Optimization II

2550113, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions
- Algorithms (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of optimization problems *without* constraints forms the contents of the lecture "Nonlinear Optimization I". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

Learning objectives:

The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.

Literature

O. Stein, Basic Concepts of Nonlinear Optimization, Springer, Berlin, 2024

Additional Literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T 7.176 Module component: Novel Actuators and Sensors [T-MACH-102152]

Coordinators: Prof. Dr. Manfred Kohl
Dr. Martin Sommer

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101287 - Microsystem Technology

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	graded	Each winter term	4

Courses					
WT 25/26	2141865	Novel actuators and sensors	2 SWS	Lecture / 🗣	Kohl, Sommer
Exams					
WT 25/26	76-T-MACH-102152	Novel Actuators and Sensors			Kohl, Sommer
ST 2026	76T-MACH-102152_2	Novel Actuators and Sensors			Kohl

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
written exam, 60 minutes

Prerequisites
T-MACH-114036 must not be started

Additional Information
The course is offered in German

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Novel actuators and sensors

2141865, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Literature
- Vorlesungsskript "Neue Aktoren" und Folienskript "Sensoren"
- Donald J. Leo, Engineering Analysis of Smart Material Systems, John Wiley & Sons, Inc., 2007
- "Sensors Update", Edited by H.Baltes, W. Göpel, J. Hesse, VCH, 1996, ISBN: 3-527-29432-5
- "Multivariate Datenanalyse – Methodik und Anwendungen in der Chemie", R. Henrion, G. Henrion, Springer 1994, ISBN 3-540-58188-X

T 7.177 Module component: Optimization under Uncertainty [T-WIWI-106545]

Coordinators: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101413 - Applications of Operations Research
M-WIWI-103278 - Optimization under Uncertainty

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	3

Courses					
WT 25/26	2550464	Optimization Under Uncertainty	2 SWS	Lecture / Blended	Rebennack, Kandora
WT 25/26	2550465	Übungen zu Optimierungsansätze unter Unsicherheit	1 SWS	Practice / On-Site	Rebennack
WT 25/26	2550466		2 SWS	Others	Rebennack
Exams					
WT 25/26	7900240	Optimization under Uncertainty			Rebennack
ST 2026	7900309	Optimization under Uncertainty			Rebennack

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

Prerequisites
None.

Workload
135 hours

T 7.178 Module component: Optoelectronic Components [T-ETIT-101907]

Coordinators: TT-Prof. Dr. Tobias Huber-Loyola
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-MACH-101287 - Microsystem Technology

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each summer term	1

Courses					
ST 2026	2309486	Optoelectronic Components	2 SWS	Lecture /	Huber-Loyola
ST 2026	2309487	Optoelectronic Components (Tutorial)	1 SWS	Practice /	Huber-Loyola
Exams					
WT 25/26	7300023	Optoelectronic Components			Randel
WT 25/26	7309486	Optoelectronic Components			Randel
ST 2026	7309486	Optoelectronic Components			Randel

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Type of Examination: oral exam

Duration of Examination: approx. 30 minutes

Modality of Exam: Oral examination, usually one examination day per month during the Summer and Winter terms. An extra questions-and-answers session will be held if students wish so.

Prerequisites
none

Recommendations
Minimal background required: Calculus, differential equations, Fourier transforms and p-n junction physics.

Additional Information
This course is recommended for Master programs. For details, see description of M-ETIT-100509 "Optoelectronic Components".

T 7.179 Module component: Overview of Manufacturing Technologies für Industrial Engineers [T-MACH-114686]

Coordinators: Prof. Dr.-Ing. Volker Schulze
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101276 - Manufacturing Technology

Type	Credits	Grading	Term offered	Expansion	Version
Coursework	1 CP	pass/fail	Each winter term	1 semesters	1

Courses					
WT 25/26	2149674	Overview of ManufacturingTechnologies for Industrial Engineers	1 SWS	Lecture / 🗣	Schulze
Exams					
WT 25/26	76-T-MACH-114686	Overview of Manufacturing Technologies für Industrial Engineers			Schulze

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Control of success is evaluated on the basis of regular attendance.
Regular attendance is achieved when the student has actively participated in at least 80 % of the course hours that have taken place.
If attendance is less than 80 %, the examiner may decide on a case-by-case basis what additional tasks must be completed in order to still achieve the learning objectives of the course. In the case of absence for an important reason (e.g., illness with a doctor's note), regular attendance is usually recognized.

Additional Information
The course is offered in German.

Workload
30 hours

Below you will find excerpts from courses related to this module component:

V Overview of ManufacturingTechnologies for Industrial Engineers
Lecture (V)
On-Site

2149674, WS 25/26, 1 SWS, Language: German, Open in study portal

Content

The lecture provides an overview of the various manufacturing processes and the systematics of their classification according to DIN 8580. The focus is on processes that are not covered in the other courses of the module.

The aim of the lecture is to place manufacturing technology within the context of production engineering and to provide an overview of manufacturing processes. To this end, the lecture conveys fundamental knowledge of manufacturing technology and covers the main types of manufacturing processes.

The specific topics include:

- Primary shaping (casting, plastics engineering, sintering, additive manufacturing processes)
- Forming (sheet-metal forming, massive forming)
- Cutting (machining with defined and undefined cutting edges, separating, ablating)
- Joining
- Coating
- Chaning material properties

Learning Outcomes:

The students ...

- are able to classify the manufacturing processes according to their fundamental mode of operation based on the six main groups defined in DIN 8580.
- are capable of naming the essential manufacturing processes of the six main groups (DIN 8580) and explaining their functions.
- are able to select suitable manufacturing processes for given components.

Workload:

regular attendance: 6 hours
self-study: 24 hours

Literature

Medien:
Skript zur Veranstaltung wird über ilias (https://ilias.studium.kit.edu/)
bereitgestellt.

Media:
Lecture notes will be provided in ilias (https://ilias.studium.kit.edu/).

T 7.180 Module component: PH APL-ING-TL01 [T-WIWI-106291]

Organisation: University
Part of: M-WIWI-101404 - Extracurricular Module in Engineering

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Once	1

T 7.181 Module component: PH APL-ING-TL02 [T-WIWI-106292]

Organisation: University
Part of: M-WIWI-101404 - Extracurricular Module in Engineering

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Once	1

T 7.182 Module component: PH APL-ING-TL03 [T-WIWI-106293]

Organisation: University
Part of: M-WIWI-101404 - Extracurricular Module in Engineering

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Once	1

T 7.183 Module component: PH APL-ING-TL04 ub [T-WIWI-106294]

Organisation: University
Part of: M-WIWI-101404 - Extracurricular Module in Engineering

Type	Credits	Grading	Term offered	Version
Coursework	0 CP	pass/fail	Once	1

T 7.184 Module component: PH APL-ING-TL05 ub [T-WIWI-106295]

Organisation: University
Part of: M-WIWI-101404 - Extracurricular Module in Engineering

Type	Credits	Grading	Term offered	Version
Coursework	0 CP	pass/fail	Once	1

T 7.185 Module component: PH APL-ING-TL06 ub [T-WIWI-106296]

Organisation: University
Part of: M-WIWI-101404 - Extracurricular Module in Engineering

Type	Credits	Grading	Term offered	Version
Coursework	0 CP	pass/fail	Once	1

T 7.186 Module component: PH APL-ING-TL07 [T-WIWI-108384]

Organisation: University
Part of: M-WIWI-101404 - Extracurricular Module in Engineering

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Once	1

T 7.187 Module component: Physical Basics of Laser Technology [T-MACH-102102]

Coordinators: Dr.-Ing. Johannes Schneider
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101262 - Emphasis Materials Science

Type	Credits	Grading	Term offered	Version
Oral examination	5 CP	graded	Each winter term	5

Courses					
WT 25/26	2181612	Physical basics of laser technology	3 SWS	Lecture / Practice / 🗣	Schneider
Exams					
WT 25/26	76-T-MACH-102102	Physical Basics of Laser Technology			Schneider
ST 2026	76-T-MACH-102102	Physical Basics of Laser Technology			Schneider

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
oral examination (ca. 25-30 min)

no tools or reference materials

Prerequisites
It is not possible, to combine this module component with Laser Material Processing [T-MACH-112763], Laser Application in Automotive Engineering [T-MACH-105164] or Physical Basics of Laser Technology [T-MACH-109084].

Recommendations
Basic knowledge of physics, chemistry and material science

Additional Information
The course is offered in German.

Workload
150 hours

Below you will find excerpts from courses related to this module component:

V Physical basics of laser technology

2181612, WS 25/26, 3 SWS, Language: German, Open in study portal

Lecture / Practice (VÜ)
On-Site

Content
Based on the description of the physical basics about the formation and the properties of laser light the lecture goes through the different types of laser beam sources used in industry these days. The lecture focuses on the usage of lasers especially in materials engineering. Other areas like measurement technology or medical applications are also mentioned.

- physical basics of laser technology
- laser beam sources (solid state, diode, gas, liquid and other lasers)
- beam properties, guiding and shaping
- lasers in materials processing
- lasers in measurement technology
- lasers for medical applications
- savety aspects

The lecture is complemented by a tutorial.

The student

- can explain the principles of light generation, the conditions for light amplification as well as the basic structure and function of different laser sources.
- can describe the influence of laser, material and process parameters for the most important methods of laser-based materials processing and choose laser sources suitable for specific applications.
- can illustrate the possible applications of laser sources in measurement and medicine technology
- can explain the requirements for safe handling of laser radiation and for the design of safe laser systems.

Basic knowledge of physics, chemistry and material science is assumed.

regular attendance: 33,5 hours
self-study: 116,5 hours

The assessment consists of an oral exam (ca. 30 min) taking place at the agreed date (according to Section 4(2), 2 of the examination regulation). The re-examination is offered upon agreement.

It is allowed to select only one of the lectures "Laser in automotive engineering" (2182642) or "Physical basics of laser technology" (2181612) during the Bachelor and Master studies.

Organizational issues
Termine für die Übung werden in der Vorlesung bekannt gegeben!

Literature
M. W. Sigrist: Laser: Theorie, Typen und Anwendungen, 2018, Springer Spektrum

T. Graf: Laser - Grundlagen der Laserstrahlerzeugung 2015, Springer Vieweg

R. Poprawe: Lasertechnik für die Fertigung, 2005, Springer

H. Hügel, T. Graf: Materialbearbeitung mit Laser, 2023, Springer Vieweg

J. Eichler, H.-J. Eichler: Lasers - Basics, Advances and Applications, 2018, Springer

W. T. Silfvast: Laser Fundamentals, 2008, Cambridge University Press

W. M. Steen: Laser Material Processing, 2010, Springer

R. Poprawe, et al.: Tailored Light 1 - High Power Lasers for Production, 2018, Springer

R. Poprawe, et al.: Tailored Light 2 - Laser Applications, 2024, Springer

T 7.188 Module component: Physics for Engineers [T-MACH-100530]

Coordinators: apl. Prof. Dr. Alexander Nesterov-Müller
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101287 - Microsystem Technology

Type	Credits	Grading	Term offered	Version
Written examination	6 CP	graded	Each summer term	1

Courses					
ST 2026	2142890	Physics for Engineers	4 SWS	Lecture / Practice / 🗣	Nesterov-Müller
Exams					
WT 25/26	76-T-MACH-100530	Physics for Engineers			Gumbsch, Dienwiebel, Nesterov-Müller, Weygand

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
written exam 90 min

Prerequisites
none

Additional Information
The course is offered in German.

Workload
150 hours

Below you will find excerpts from courses related to this module component:

V Physics for Engineers

2142890, SS 2026, 4 SWS, Language: German, Open in study portal

Lecture / Practice (VÜ)
On-Site

Content
1) Foundations of solid state physics

- Wave particle dualism
- Tunnelling
- Schrödinger equation
- H-atom

2) Electrical conductivity of solids

- solid state: periodic potentials
- Pauli Principle
- band structure
- metals, semiconductors and isolators
- p-n junction / diode

3) Optics

- quantum mechanical principles of the laser
- linear optics
- non-linear optics

Exercises are used for complementing and deepening the contents of the lecture as well as for answering more extensive questions raised by the students and for testing progress in learning of the topics.

The student

- has the basic understanding of the physical foundations to explain the relationship between the quantum mechanical principles and the optical as well as electrical properties of materials
- can describe the fundamental experiments, which allow the illustration of these principles

regular attendance: 22,5 hours (lecture) and 22,5 hours (excerises)
self-study: 105 hours

The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation).

Literature

- Tipler und Mosca: Physik für Wissenschaftler und Ingenieure, Elsevier, 2004
- Haken und Wolf: Atom- und Quantenphysik. Einführung in die experimentellen und theoretischen Grundlagen, 7. Aufl., Springer, 2000
- Harris, Moderne Physik, Pearson Verlag, 2013

T 7.189 Module component: Platform Economy [T-WIWI-107506]

Coordinators: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101421 - Supply Chain Management
M-WIWI-101434 - eBusiness and Service Management
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each winter term	4

Courses					
WT 25/26	2540468	Platform Economy	2 SWS	Lecture / 🗣	Weinhardt, Fegert
WT 25/26	2540469	Übung zu Platform Economy	1 SWS	Practice / 🗣	Stano
Exams					
WT 25/26	7900213	Platform Economy			Weinhardt

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, x Cancelled

Assessment
Alternative exam assessment. The assessment is carried out in the form of a one-hour written examination and by carrying out a case study. Details on the assessment will be announced during the lecture.

Prerequisites
see below

Recommendations
None

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Platform Economy

2540468, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

The date for the lecture kick-off this Semester will be published soon.

Lecture and Exercise

The "Platform Economy" lecture provides a broad range of knowledge related to online platforms and their business models, examining their significance for users, operators, and society as a whole. The course is structured into 8 topical blocks, each exploring a different aspect of the platform economy in depth. Each block is led by a different lecturer who is an expert in the respective topic. The key topics covered in the lecture include:

Network Effects and Two-Sided Markets

- Business Models and Auctions
- Energy Market Engineering
- Digital Involvement: Crowd X & Citizen Science
- Digital Democracy and Social Media
- Analyzing User Behavior
- Trust and Reputation in Digital Platforms
- Ethical Considerations in the Platform Economy

To reinforce the lecture material, each block is accompanied by interactive exercises that encourage a deeper understanding of the topics. In these exercises, students will engage in discussions and explore practical examples that illustrate the theoretical concepts introduced during the lectures. The lecture and exercise also offer a chance to get an idea of the lectures offered during the master's program at our chair.

Case Study

In addition to the lectures, you will work on a case study in small groups. Your task will be to develop a business model for an innovative and novel online platform, which will be presented to you by one of our experts, either from the academic team or the industry. This case study offers a chance to gain deeper insights into current trends in the platform economy and to apply the knowledge acquired throughout the course in a practical, hands-on way.

Literature

- Bundesministerium für Wirtschaft und Energie (2017). „Kompetenzen für eine digitale Sourveränität“(abrufbar unter https://www.bmwi.de/Redaktion/DE/Publikationen/Studien/kompetenzen-fuer-eine-digitale-souveraenitaet.html)
- Bundesministerium für Wirtschaft und Energie (2017). „Weißbuch Digitale Plattformen.“ (abrufbar unter https://www.bmwi.de/Redaktion/DE/Publikationen/Digitale-Welt/weissbuch-digitale-plattformen.pdf?__blob=publicationFile&v=8)
- Easley, D., and Kleinberg, J. 2010. “Network Effects,” in Networks, Crowds, and Markets: Reasoning about a Highly Connected World, Cambridge University Press, pp. 509–542.
- Eisenmann, T., Parker, G., and Van Alstyne, M. W. 2006. “Strategies for two-sided markets,” Harvard Business Review 84(10), pp. 1–11.
- Gassmann, O., Frankenberger, K., and Csik, M. 2013. Geschäftsmodelle entwickeln: 55 innovative Konzepte mit dem St. Galler Business Model Navigator, Hanser.
- Wattenhofer, R. 2016. “The science of the blockchain.” CreateSpace Independent Publishing Platform.
- Roth, A. 2002. “The Economist as Engineer: Game Theory, Experimental Economics and Computation as Tools for Design Economics,” Econometrica 70(4): 1341-1378, 2002.
- Weinhardt, C. ,Holtmann, C., Neumann, D., Market Engineering. Wirtschaftsinformatik, 2003.
- Wolfstetter, E., 1999. “Topics in Microeconomics - Industrial Organization, Auctions, and Incentives,” Cambridge, Cambridge University Press.
- Teubner, T., and Hawlitschek, F. (in press). “The economics of P2P online sharing,” in The Sharing Economy: Possibilities, Challenges, and the way forward, Praeger Publishing.

T 7.190 Module component: Polymer Engineering I [T-MACH-102137]

Coordinators: Dr.-Ing. Wilfried Liebig
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101262 - Emphasis Materials Science

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each winter term	2

Courses					
WT 25/26	2173590	Polymer Engineering I	2 SWS	Lecture / 🗣	Liebig
Exams					
WT 25/26	76-T-MACH-102137	Polymer Engineering I			Liebig
ST 2026	76-T-MACH-102137	Polymer Engineering I			Liebig

Legend: 🖥 Online, ⯐ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral exam, about 25 minutes

Prerequisites
T-MACH-114007 must not have been started

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Polymer Engineering I

2173590, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
1. Economical aspects of polymers
2. Introductiom of mechanical,
chemical end electrical properties
3. Processing of polymers
(introduction)
4. Material science of polymers
5. Synthesis

learning objectives:

The field of Polymer Engineering includes synthesis, material science, processing, construction, design, tool engineering, production technology, surface engineering and recycling. The aim is, to equip the students with knowledge and technical skills, and to use the material "polymer" meeting its requirements in an economical and ecological way.

The students

- are able to describe and classify polymers
  based on the fundamental synthesis processing techniques
- can find practical applications for state-of-the-art polymers and manufacturing technologies
- are able to apply the processing techniques, the application of polymers and polymer composites regarding to the basic principles of material science
- can describe the special mechanical, chemical and elctrical prooperties of polymers and correlate these properties to the chemical bindings.
- can define application areas and the limitation in the use of polymers

requirements:
none

workload:

regular attendance: 21 hours
self-study: 99 hours

Literature
Literaturhinweise, Unterlagen und Teilmanuskript werden in der Vorlesung ausgegeben.

T 7.191 Module component: Polymer Engineering II [T-MACH-102138]

Coordinators: Dr.-Ing. Wilfried Liebig
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101262 - Emphasis Materials Science

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each summer term	2

Courses					
ST 2026	2174596	Polymer Engineering II	2 SWS	Lecture / 🗣	Liebig
Exams					
WT 25/26	76-T-MACH-102138	Polymerengineering II			Liebig
ST 2026	76-T-MACH-102138	Polymerengineering II			Liebig

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral exam, about 25 minutes

Prerequisites
T-MACH-114007 must not be started.

Recommendations
Knowledge in Polymerengineering I

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Polymer Engineering II

2174596, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
1. Processing of polymers
2. Properties of polymer components
Based on practical examples and components
2.1 Selection of material
2.2 Component design
2.3 Tool engineering
2.4 Production technology
2.5 Surface engineering
2.6 Sustainability, recycling

learning objectives:

The field of Polymer Engineering includes synthesis, material science, processing, construction, design, tool engineering, production technology, surface engineering and recycling. The aim is, that the students gather knowledge and technical skills to use the material "polymer" meeting its requirements in an economical and ecological way.

The students

- can describe and classify different processing techniques
  and can exemplify mould design principles based on technical parts.
- know about practical applications and processing of polymer parts
- are able to design polymer parts according to given restrictions
- can choose appropriate polymers based on the technical requirements
- can decide how to use polymers regarding the production, economical and ecological requirements

requirements:
Polymerengineering I
workload:

The workload for the lecture Polymerengineering II is 120 h per semester and consists of the presence during the lecture (21 h) as well as preparation and rework time at home (99 h).

Literature
Literaturhinweise, Unterlagen und Teilmanuskript werden in der Vorlesung ausgegeben.

Recommended literature and selected official lecture notes are provided in the lecture.

7.192 Module component: Power Generation [T-ETIT-101924]

Coordinators: Dr.-Ing. Bernd Hoferer
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-106821 - Electric Energy Systems and Power Generation

Type	Credits	Grading	Term offered	Version
Oral examination	3 CP	graded	Each summer term	3

Courses					
WT 25/26	2307356	Power Generation	2 SWS	Lecture / ✕	Hoferer
ST 2026	2307356	Power Generation	2 SWS	Lecture / 🗣	Hoferer
Exams					
WT 25/26	7307356	Power Generation			Hoferer
ST 2026	7307356	Power Generation			Hoferer

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Prerequisites
none

T 7.193 Module component: Practical Seminar: Digital Services [T-WIWI-110888]

Coordinators: Prof. Dr. Gerhard Satzger
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-102752 - Fundamentals of Digital Service Systems
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each summer term	1

Assessment
The assessment consists of a seminar paper, a presentation of the results and the contribution to the discussion. In the seminar, a maximum score of 60 points can be achieved, consisting of

- maximum 25 points for the documentation (written examination)
- maximum 25 points for the practical assessment
- maximum 10 points for the participation during the discussion sessions

The practical seminar is passed when at least a score of 30 points is achieved.

Prerequisites
None

Recommendations
None

Additional Information
The current range of seminar topics is announced on the following Website:
www.dsi.iism.kit.edu.

T 7.194 Module component: Practical Seminar: Interactive Systems [T-WIWI-111914]

Coordinators: Prof. Dr. Alexander Mädche
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-105928 - HR Management & Digital Workplace
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each term	2

Courses					
WT 25/26	2540555	Practical Seminar: Interactive Systems	3 SWS	Lecture / 🗘	Mädche
ST 2026	2500073	Practical Seminar: AI-based Mental Healthcare	3 SWS	Lecture / 🗘	Kuhlmeier, Mädche
ST 2026	2540555	Practical Seminar: Interactive Systems	3 SWS	Lecture / 🗘	Mädche
Exams					
WT 25/26	7900367	Practical Seminar: Interactive Systems			Mädche

Legend: 🖥 Online, 🗘 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Alternative exam assessment.

The assessment of this course consists of the implementation of a practical component, the preparation of a written documentation, and active participation in the discussions.

A total of 60 points can be achieved, of which:

- maximum 25 points for the written documentation
- maximum 25 points for the practical component
- maximum 10 points for active participation in the discussions

A minimum of 30 points must be achieved to pass this course.

Please note that a practical component, such as conducting a survey or implementing an application, is also part of the course. Please refer to the institute website issd.iism.kit.edu for the current offer of practical seminar theses.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Practical Seminar: AI-based Mental Healthcare

2500073, SS 2026, 3 SWS, Language: English, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Content

Mental health disorders affect a significant share of the global population. Meeting the resulting demand for care is a challenge on two fronts: patients face long waiting times and limited access to support, while mental health practitioners work under significant time pressure with processes that are often still manual and fragmented. Two developments in AI offer complementary responses: AI-based process digitalization can make clinical and therapeutic workflows more efficient for practitioners, while conversational AI agents can extend therapeutic support directly to those who need it. This seminar engages students with both developments: working on real, ongoing projects at the h-lab and its clinical partners, students design, build, and evaluate prototypes of AI-based applications for mental health and acquire the domain knowledge needed to do so responsibly.

Three project briefs are available, each rooted in an active h-lab research project. Students may also propose their own project in the mental health and AI space.

1. **AI-assisted ADHD assessment system** in collaboration with LWL-Klinikum Marsberg, centered on the analysis of primary school reports as a source of retrospective diagnostic evidence. Example tasks include building an OCR and LLM pipeline for extracting and analyzing free-text reports, or evaluating the diagnostic utility of LLM-generated assessments against clinician judgments.
2. **AI-enhanced CBT group therapy platform** in collaboration with Rethink Wellbeing. Example tasks include building a faciliator feedback system that monitors group dynamics and recommends facilitator actions, automating participant or facilitator selection workflows, or evaluating the accuracy and clinical acceptability of AI-generated recommendations.
3. **AI-based Conversational Mental Health Agents**, in collaboration with the Chair of Clinical Psychology and Psychotherapy at the University of Greifswald. The h-lab and its partners developed an LLM-based chatbot that delivers a single-session behavioral activation session for young people with depressive symptoms. Example tasks include improving the behavioral activation module, implementing additional therapeutic modules (cognitive restructuring, sleep hygiene, emotion regulation, social skills) as LLM-based multi-agent systems, or evaluating agent outputs for therapeutic fidelity and safety.

The seminar is structured around **three phases**:

1. **Introductory session:** Introduction to designing and evaluating AI-based mental health and the project briefs.
2. **Working phase:** Students design, develop, and evaluate their prototypes (individually or in groups), with ad hoc support from h-lab assistants.
3. **Final presentation**: Groups present their projects, including a demonstration of their working prototype and a discussion of their evaluation approach and preliminary findings. Participants provide feedback to each other's projects. Technical documentation and a brief evaluation report are due at the end of the semester.

Learning Objectives: Upon completion, students will be able to:

- Understand the mental health domain sufficiently to make informed design decisions
- Build functional AI-based application prototypes addressing a concrete need in an active mental health research or practice context
- Design and apply appropriate evaluation strategies for AI-based mental health applications, assessing feasibility, effectiveness, and safety of their prototypes

V **Practical Seminar: Interactive Systems**
2540555, SS 2026, 3 SWS, Language: English, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Content

In this practical seminar, students get an individual assignment and develop a running software prototype. Beside the software prototype, the students also deliver a written documentation.

Please find the current open offerings on our website: https://h-lab.iism.kit.edu/thesis.php

7.195 Module component: Practical Seminar: Platform Economy [T-WIWI-112154]

Coordinators: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each term	2

Assessment
The assessment of this course is in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class. Please take into account that, beside the written documentation, also a practical component (e.g. implementation of a prototype) is part of the course. Please examine the course description for the particular tasks. The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class).

Prerequisites
None.

Additional Information
Teaching and learning format: Seminar

Workload
135 hours

T 7.196 Module component: Principles of Whole Vehicle Engineering [T-MACH-114095]

Coordinators: Dr. Manfred Harrer
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101265 - Vehicle Development

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	graded	Each term	3

Courses					
WT 25/26	2113851	Principles of Whole Vehicle Engineering I	1 SWS	Lecture / 🗣	Harrer
ST 2026	2114860	Principles of Whole Vehicle Engineering II	1 SWS	/ 🗣	Harrer
Exams					
WT 25/26	76-T-MACH-114095	Principles of Whole Vehicle Engineering			Harrer
ST 2026	76-T-MACH-114095	Principles of Whole Vehicle Engineering			Harrer

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written examination

Duration: 90 minutes

Auxiliary means: none

Prerequisites
T-MACH-114075 – Grundsätze der PKW-Entwicklung must not be started.

Additional Information
The course is offered in English.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Principles of Whole Vehicle Engineering I

2113851, WS 25/26, 1 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
1. Process of automobile development
2. Conceptual dimensioning and design of an automobile
3. Laws and regulations – National and international boundary conditions
4. Aero dynamical dimensioning and design of an automobile I
5. Aero dynamical dimensioning and design of an automobile II
6. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines I
7. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines II

Learning Objectives:

The students have an overview of the fundamentals of the development of automobiles. They know the development process, the national and the international legal requirements that are to be met. They have knowledge about the thermo-management, aerodynamics and the design of an automobile. They are ready to judge goal conflicts in the field of automobile development and to work out approaches to solving a problem.

Organizational issues

You will find the lecture material on ILIAS. To get the ILIAS password, KIT students refer to https://fast-web-01.fast.kit.edu/PasswoerterIlias/

Termine und nähere Informationen finden Sie auf der Institutshomepage.

Dats and further information will be published on the homepage of the institute.

Kann nicht mit Lehrveranstaltung 2113810 kombiniert werden

Cannot be combined with lecture 2113810.

Literature

Skript zur Vorlesung wird zu Beginn des Semesters ausgegeben

The scriptum will be provided during the first lessons

V

Principles of Whole Vehicle Engineering II

2114860, SS 2026, 1 SWS, Language: English, Open in study portal

On-Site

Content

1. Application-oriented material and production technology I
2. Application-oriented material and production technology II
3. Overall vehicle acoustics in the automobile development
4. Drive train acoustics in the automobile development
5. Testing of the complete vehicle
6. Properties of the complete automobile

Learning Objectives:

The students are familiar with the selection of appropriate materials and the choice of adequate production technology. They have knowledge of the acoustical properties of the automobiles, covering both the interior sound and exterior noise. They have an overview of the testing procedures of the automobiles. They know in detail the evaluation of the properties of the complete automobile. They are ready to participate competently in the development process of the complete vehicle.

Organizational issues

Dates and further information will be published on the homepage of the institute.

Veranstaltung findet als Blockvorlesung statt.

Kann nicht mit der Veranstaltung [2114842] kombiniert werden.

Cannot be combined with lecture [2114842].

Literature

Das Skript zur Vorlesung ist über ILIAS verfügbar.

T 7.197 Module component: Principles of Whole Vehicle Engineering (in German) [T-MACH-114075]

Coordinators: Dr. Manfred Harrer
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101265 - Vehicle Development

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	graded	Each term	2

Courses					
WT 25/26	2113810	Fundamentals of Automobile Development I	1 SWS	Lecture / 🗣	Harrer
ST 2026	2114842	Principles of Whole Vehicle Engineering II	1 SWS	Block / 🗣	Harrer
Exams					
WT 25/26	76-T-MACH-114075	Principles of Whole Vehicle Engineering			Harrer
ST 2026	76-T-MACH-114075	Principles of Whole Vehicle Engineering			Harrer

Legend: 🖥 Online, ✣ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written examination

Duration: 90 minutes

Auxiliary means: none

Prerequisites
T-MACH-114095 - Fundamentals of Automobile Development must not be started.

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Fundamentals of Automobile Development I

Lecture (V)
On-Site

2113810, WS 25/26, 1 SWS, Language: German, Open in study portal

Content
1. Process of automobile development
2. Conceptual dimensioning and design of an automobile
3. Laws and regulations – National and international boundary conditions
4. Aero dynamical dimensioning and design of an automobile I
5. Aero dynamical dimensioning and design of an automobile II
6. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines I
7. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines II

Learning Objecitves:

The students have an overview of the fundamentals of the development of automobiles. They know the development process, the national and the international legal requirements that are to be met. They have knowledge about the thermo-management, aerodynamics and the design of an automobile. They are ready to judge goal conflicts in the field of automobile development and to work out approaches to solving a problem.

Organizational issues
Das Vorlesungsmaterial wird auf ILIAS bereitgestellt. Das ILIAS-Passwort erhalten Sie unter https://fast-web-01.fast.kit.edu/PasswoerterIlias/

Termine und nähere Informationen finden Sie auf der Institutshomepage.

Kann nicht mit Lehrveranstaltung 2113851 kombiniert werden.

Date and further information will be published on the homepage of the institute.

Cannot be combined with lecture 2113851.

Literature
Skript zur Vorlesung wird zu Beginn des Semesters ausgegeben

The scriptum will be provided during the first lessons

V **Principles of Whole Vehicle Engineering II**
2114842, SS 2026, 1 SWS, Language: German, Open in study portal

Block (B)
On-Site

Content
1. Application-oriented material and production technology I
2. Application-oriented material and production technology II
3. Overall vehicle acoustics in the automobile development
4. Drive train acoustics in the automobile development
5. Testing of the complete vehicle
6. Properties of the complete automobile

Learning Objectives:

The students are familiar with the selection of appropriate materials and the choice of adequate production technology. They have knowledge of the acoustical properties of the automobiles, covering both the interior sound and exterior noise. They have an overview of the testing procedures of the automobiles. They know in detail the evaluation of the properties of the complete automobile. They are ready to participate competently in the development process of the complete vehicle.

Organizational issues
Vorlesung findet als Blockvorlesung statt. Termine werden über die Homepage des Instituts bekannt gegeben.

Kann nicht mit der Veranstaltung [2114860] kombiniert werden.

Cannot be combined with lecture [2114860].

Literature
Skript zur Vorlesung ist über ILIAS verfügbar.

T 7.198 Module component: Procedures of Remote Sensing [T-BGU-103542]

Coordinators: Dr.-Ing. Uwe Weidner
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Version
Oral examination	3 CP	graded	2

Courses					
ST 2026	6020243	Procedures of Remote Sensing	2 SWS	Lecture / 🗣	Weidner

Legend: 🖥 Online, ⚄ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 7.199 Module component: Procedures of Remote Sensing, Prerequisite [T-BGU-101638]

Coordinators: Dr.-Ing. Uwe Weidner
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Term offered	Version
Coursework	1 CP	pass/fail	Each summer term	2

Courses					
ST 2026	6020244	Procedures of Remote Sensing, Excercise	1 SWS	Practice / 🗣	Weidner

Legend: 🖥 Online, ⚄ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Prerequisites
None

Recommendations
None

Additional Information
None

Workload
30 hours

T 7.200 Module component: Process Design for Machining of Metallic Components [T-MACH-114058]

Coordinators: Prof. Dr.-Ing. Volker Schulze
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-101276 - Manufacturing Technology

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	4 CP	graded	Each winter term	1 semesters	1

Courses					
WT 25/26	2149672	Process Design for Machining of Metallic Components	3 SWS	Lecture / 🗣	Schulze
Exams					
WT 25/26	76-T-MACH-114058	Process Design for Machining of Metallic Components			Schulze

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
written exam, duration 60 minutes

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V **Process Design for Machining of Metallic Components** — **Lecture (V) On-Site**
2149672, WS 25/26, 3 SWS, Language: German, Open in study portal

Content
The objective of the course “Process Development for Machining Metallic Components” is to enable students to descripe essential machining processes for metallic parts. Based on mechanical and materials fundamentals, the course covers all machining methods.

Within this course, students learn theoretical and application aspects of the following topics:

- Orthogonal cutting (cutting forces, rake angle, friction, tool wear)
- Turning and drilling (tool geometry, chip formation, setup times, productivity)
- Milling (face, contour, profile milling; high-speed milling)
- Grinding (wheel composition, thermal effects, surface integrity)
- Honing, lapping, polishing (tolerances, microstructure, surface quality)
- Process chains (raw part → rough machining → finish; handover parameters)
- Modeling and simulation (FEM-based modeling; empirical models)
- Chip formation simulation (numerical prediction of chip shape and breakage)
- Large-scale modeling (wear modeling; sensor integration)
- CNC machining and machine dynamics (G-/M-Codes; axis dynamics; chatter avoidance).

The acquired knowledge is supplemented by practical lectures from industry, which offer valuable insights into current applications, challenges and innovations in machining methods.

Learning Outcomes:

The students ...

- can describe the fundamental mechanisms and characteristic features of individual machining processes (orthogonal cutting, turning, drilling, milling, grinding, honing, lapping, polishing).
- are able to classify machining methods by their operating principle (geometry-defined vs. geometry-indeterminate) and categorize them based on technical parameters (cutting force, feed rate, material removal rate).
- can select an appropriate process for given component requirements (material, geometry, tolerance) and justify their choice.
- are capable of identifying interactions between individual steps in a multi-stage process chain and integrating them effectively.
- can evaluate machining processes with respect to technical factors (material behavior, tool wear, surface integrity) and economic considerations (setup time, productivity, cost metrics) and develop an optimized process strategy.
- are able to apply basic modeling and simulation methods (FEM-based models, empirical approaches) to estimate cutting forces, temperatures, and tool life.
- can interpret numerical chip-formation simulations and use them for process optimization and tool design.
- understand the fundamentals of CNC programming (G- and M-codes) and can analyze machine-dynamic effects (axis dynamics, vibration phenomena, chatter) to ensure stable machining.

Workload:

regular attendance: 21 hours
self-study: 99 hours

Literature
Medien:
Skript zur Veranstaltung wird über ilias (https://ilias.studium.kit.edu/)
bereitgestellt.

Media:
Lecture notes will be provided in ilias (https://ilias.studium.kit.edu/).

T 7.201 Module component: Product- and Production-Concepts for Modern Automobiles [T-MACH-110318]

Coordinators: Dr. Stefan Kienzle
Dr. Dieter Steegmüller

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each winter term	1

Courses					
WT 25/26	2149670	Product- and Production-Concepts for modern Automobiles	2 SWS	Lecture /	Steegmüller, Kienzle
Exams					
WT 25/26	76-T-MACH-110318	Product- and Production-Concepts for modern Automobiles			Steegmüller, Kienzle

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Oral Exam (20 min)

Prerequisites
T-MACH-105166 - Materials and Processes for Body Leightweight Construction in the Automotive Industry must not have been started.

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Product- and Production-Concepts for modern Automobiles

2149670, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Content

The lecture illuminates the practical challenges of modern automotive engineering. As former leaders of the automotive industry, the lecturers refer to current aspects of automotive product development and production.

The aim is to provide students with an overview of technological trends in the automotive industry. In this context, the course also focuses on changes in requirements due to new vehicle concepts, which may be caused by increased demands for individualisation, digitisation and sustainability. The challenges that arise in this context will be examined from both a production technology and product development perspective and will be illustrated with practical examples thanks to the many years of industrial experience of both lecturers.

The topics covered are:

- General conditions for vehicle and body development
- Integration of new drive technologies
- Functional requirements (crash safety etc.), also for electric vehicles
- Development Process at the Interface Product & Production, CAE/Simulation
- Energy storage and supply infrastructure
- Aluminium and lightweight steel construction
- FRP and hybrid parts
- Battery, fuel cell and electric motor production
- Joining technology in modern car bodies
- Modern factories and production processes, Industry 4.0.

Learning Outcomes:

The students ...

- are able to name the presented general conditions of vehicle development and are able to discuss their influences on the final product using practical examples.
- are able to name the various lightweight approaches and identify possible areas of application.
- are able to identify the different production processes for manufacturing lightweight structures and explain their functions.
- are able to perform a process selection based on the methods and their characteristics.

Workload:

regular attendance: 25 hours
self-study: 95 hours

Organizational issues

Termine werden über Ilias bekannt gegeben.

Bei der Vorlesung handelt es sich um eine Blockveranstaltung. Eine Anmeldung über Ilias ist erforderlich.

Zur Vertiefung des im Rahmen der Lehrveranstaltung erworbenen Wissens werden die theoretischen Vorlesungseinheiten durch Praxiseinheiten im Umfeld der Karlsruher Forschungsfabrik (https://www.karlsruher-forschungsfabrik.de) unterstützt.

The lecture is a block course. An application in Ilias is mandatory.

The theoretical lectures are complemented by practical lectures in the Karlsruhe Research Factory (https://www.karlsruher-forschungsfabrik.de/en.html) to deepen the acquired knowledge.

Literature

Medien:
Skript zur Veranstaltung wird über (https://ilias.studium.kit.edu/) bereitgestellt.

Media:
Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/).

T 7.202 Module component: Production Economics and Sustainability [T-WIWI-102820]

Coordinators: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101437 - Industrial Production I

Type	Credits	Grading	Term offered	Version
Written examination	3,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2581960	Production Economics and Sustainability	2 SWS	Lecture / 🗣	Schultmann, Steins
Exams					
WT 25/26	7981960	Production Economics and Sustainability			Schultmann
ST 2026	7981960	Production Economics and Sustainability			Schultmann

Legend: 📱 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of an oral (30 minutes) or written exam (60 minutes) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Workload
105 hours

Below you will find excerpts from courses related to this module component:

V Production Economics and Sustainability

2581960, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The focus of the lecture is on the development of production systems towards more sustainable production. The lecture concentrates on the assessment of economically and ecologically reasonable measures and their potential implementation in companies. Relevant methods (including material flow analysis, life cycle assessment, eco-chart of accounts, investment planning) are also presented in the lecture.

Topics:
- Resources
- Material flow analysis
- Life cycle assessment
- Carbon footprint and water footprint
- Environmental management and environmental controlling
- Investment planning
- Circular planning
- Circular economy

Organizational issues
Seminarraum Uni-West, Geb. 06.33

Literature
wird in der Veranstaltung bekannt gegeben

T 7.203 Module component: Production Technology for E-Mobility [T-MACH-110984]

Coordinators: Prof. Dr.-Ing. Jürgen Fleischer
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	graded	Each summer term	2

Courses					
ST 2026	2150605	Production Technology for E-Mobility	3 SWS	Lecture / 🗣	Fleischer
Exams					
WT 25/26	76-T-MACH-112969	Production Technology for E-Mobility			Fleischer

Legend: 📱 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written Exam (60 min)

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Production Technology for E-Mobility

2150605, SS 2026, 3 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
In the lecture Production Engineering for Electromobility the students should be enabled to design, select and develop production processes for the production of the components of an electric drive train (electric motor, battery cells, fuel cells) by using research-oriented teaching.

Learning Outcomes:

The students are able to:

- describe the structure and function of a fuel cell, an electric traction drive and a batterysystem.
- reproduce the process chains for the production of the components fuel cell, battery and electric traction drive.
- apply methodical tools to solve problems along the process chain.
- derive the challenges in the production of electric drives for electric mobility.
- describe the factors influencing the individual process steps on each other using the process chain of Li-ion battery cells.
- enumerate or describe the necessary process parameters to counteract the influencing factors of the process steps in Li-ion battery cell production.
- apply methodical tools to solve problems along the process chain for the production of Li-ion battery cells.
- derive the challenge of mounting and dismounting battery modules.
- derive the challenges in the production of fuel cells for use in mobility.
- develop solutions to overcome challenges in the production of fuel cells.

Workload:

regular attendance: 42 hours
self-study: 78 hours

Literature

Skript zur Veranstaltung wird über Ilias (https://ilias.studium.kit.edu/) bereitgestellt.

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/)

T 7.204 Module component: Production, Logistics and Information Systems [T-WIWI-111602]

Coordinators: Prof. Dr. Wolf Fichtner
Prof. Dr. Andreas Geyer-Schulz
Prof. Dr. Alexander Mädche
Prof. Dr. Stefan Nickel
Prof. Dr. Frank Schultmann
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-105770 - Production, Logistics and Information Systems

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each winter term	2

Courses					
WT 25/26	2600004		2 SWS	Lecture	Mädche, Feick
WT 25/26	2600005	Produktion und Logistik	2 SWS	Lecture / 🗣	Fichtner, Nickel, Schultmann
WT 25/26	2610029		2 SWS	Tutorial	Ruckes
Exams					
WT 25/26	7900154	Production, Logistics and Information Systems			Schultmann, Nickel, Weinhardt, Mädche, Geyer-Schulz, Fichtner
ST 2026	7900077	Production, Logistics and Information Systems			Schultmann, Nickel, Fichtner, Weinhardt, Mädche, Geyer-Schulz

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written Exam (90 min). The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible at any regular examination date.

Workload
150 hours

Below you will find excerpts from courses related to this module component:

V 2600004, WS 25/26, 2 SWS, Open in study portal **Lecture (V)**

T 7.205 Module component: Project Course Additive Manufacturing: Design Optimization and Production of Metallic Components [T-MACH-113575]

Coordinators: Prof. Dr.-Ing. Frederik Zanger
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Examination of another type	4 CP	graded	Each summer term	3

Courses					
ST 2026	2150704	Project Course Additive Manufacturing: Design Optimization and Production of Metallic Components	3 SWS	Practical course / 🗣	Zanger, Frey

Legend: Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Assessment of another type of examination (graded)

The competence certificate is a project work; alternative test achievement according to § 4 Abs. 2 No. 3 of the SPO. Here, the project work, the milestone-based presentation of the results in presentation form (10 min each) and a final oral examination (15 min) are included in the assessment.

Prerequisites
The following module component may not have started:

- T-MACH-114019 - Additive Fertigung metallischer Bauteile: Designoptimierung und Herstellung
- T-MACH-110983 - Projektpraktikum Additive Fertigung: Entwicklung und Fertigung eines additiven Bauteils
- T-MACH-114624 - Projektpraktikum Additive Fertigung: Designoptimierung und Herstellung metallischer Bauteile
- T-MACH-110960 - Projektpraktikum Additive Fertigung: Entwicklung und Fertigung eines additiven Bauteils

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Project Course Additive Manufacturing: Design Optimization and Production of Metallic Components

Practical course (P)
On-Site

2150704, SS 2026, 3 SWS, Language: German, Open in study portal

Content

The course “Project Course Additive Manufacturing: Design Optimization and Production of Metallic Components” combines the fundamentals of powder bed fusion laser beam melting (PBF-LB/M) with a development project in collaboration with an industry-relevant application case.

Students learn the basics of the following topics:

- Influence of various process variables on the component quality of parts manufactured using the PBF-LB/M process
- Preparation and simulation of the PBF-LB/M process
- Manufacturing of additive metal components
- Process monitoring and quality assurance in additive manufacturing
- Topology optimization
- Computer-aided manufacturing (CAM) for machining rework

The topics are demonstrated in practice in various workshops on the individual topics and transferred to the development task in teamwork. Finally, the results of the work are additively manufactured and machined. The results are then presented, reflected upon, and discussed.

Attendance of the course “Additive Fertigung metallischer Bauteile” is recommended.

Learning Outcomes:

Students ...

- can describe the characteristics and areas of application of the additive manufacturing process powder bed fusion of metals (PBF-LB/M).
- can describe and implement the creation of a product along the entire additive process chain (CAD, simulation, construction job preparation, CAM) from the initial idea to production.
- are able to discuss the development process for components that are optimized for additive manufacturing.
- are able to perform topology optimization of a component for manufacturing using additive manufacturing.
- are able to simulate the additive process, compensate for process-related distortion, and determine the ideal alignment on the build platform.
- are able to create the necessary support structures for the additive process and derive a build job file.
- are able to create a CAM model for the machining post-processing of additive components and to machine the component.
- can select suitable powder fractions and process variables for the additive manufacturing of high-quality components based on existing test results.

Workload:

regular attendance: 14 hours
self-study: 106 hours

Organizational issues

Das Praktikum wird erstmals im Sommersemester 2026 angeboten.

Unregelmäßige Termine, siehe Zeitplan auf wbk-Homepage.
Irregular dates, see schedule on the wbk homepage.

Literature

Skript zur Veranstaltung wird über (https://ilias.studium.kit.edu/) bereitgestellt.

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/).

T 7.206 Module component: Project in Applied Remote Sensing [T-BGU-101814]

Coordinators: Prof. Dr.-Ing. Stefan Hinz
Dr.-Ing. Uwe Weidner
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Version
Coursework	1 CP	pass/fail	1

Courses					
ST 2026	6020245	Project Exercise Applied Remote Sensing	2 SWS	Practice / 🗣	Hinz, Weidner, Wursthorn

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Workload
30 hours

T 7.207 Module component: Project Management [T-BGU-113720]

Coordinators: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-BGU-101004 - Fundamentals of Construction

Type	Credits	Grading	Term offered	Expansion	Version
Examination of another type	3 CP	graded	Each winter term	1 semesters	1

Courses					
WT 25/26	6200106	Project Management	2 SWS	Lecture / Practice / 🗣	Haghsheno, Schneider, Gloser
Exams					
WT 25/26	8230113720	Project Management			Haghsheno, Schneider

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
preparation of a term paper, appr. 5 pages, with presentation, appr. 10 min., and online test, 45 min.

Prerequisites
The Examination Prerequisite Project Management (T-BGU-113454) has to be passed.

Recommendations
participation in the online mock test in the last lecture of the winter semester

Additional Information
None

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V Project Management

6200106, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture / Practice (VÜ)
On-Site

Content
This course provides a comprehensive introduction to (construction) project management. It takes a closer look at the organisation and delivery of a construction project from the client's perspective. In this context, a range of competences are presented that should be on hand for the successful execution of project management. In addition, we present a selection of project management methods for individual competences and illustrate them with case studies.

Organizational issues
Vorlesungen: Mittwochs vom 29.10.2025 bis 18.02.2026, jeweils 09:45 – 11:15 Uhr (hybrid)

Übungen: Asynchron ab 19.11.2025, 10.12.2025, 14.01.2026, 11.02.2026 (online)

Literature

- AHRENS, Hannsjörg; BASTIAN, Klemens; MUCHOWSKI, Lucian (Hrsg.) (2021) *Handbuch Projektsteuerung - Baumanagement: Ein praxisorientierter Leitfaden mit zahlreichen Hilfsmitteln und Arbeitsunterlagen*, 6. Auflage, Fraunhofer IRB Verlag, Stuttgart
- GPM Deutsche Gesellschaft für Projektmanagement e. V. (Hrsg.) (2017) *Individual Competence Baseline für Projektmanagement (Version 4.0)*, 1. Auflage, GPM Deutsche Gesellschaft für Projektmanagement e. V., Nürnberg
- HAGHSHENO, Shervin; JOHN, Paul Christian (2024) *Bauherrnseitige Projektmanagement-Dienstleistungen in Deutschland*, Forschungsbericht, DVP – Deutscher Verband für Projektmanagement in der Bau- und Immobilienwirtschaft e. V.
- KOCHENDÖRFER, Bernd; LIEBCHEN, Jens H.; VIERING, Markus G. (2021) *Bau-Projekt-Management: Grundlagen und Vorgehensweisen*, 6. Auflage, Springer Vieweg, Wiesbaden
- SCHULZ, Markus (2020) *Projektmanagement: Zielgerichtet. Effizient. Klar.*, 2. Auflage, UVK Verlag, Tübingen

T 7.208 Module component: Project Workshop: Automotive Engineering [T-MACH-102156]

Coordinators: Dr.-Ing. Michael Frey
Dr.-Ing. Martin Gießler

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101264 - Handling Characteristics of Motor Vehicles
M-MACH-101265 - Vehicle Development
M-MACH-101266 - Automotive Engineering

Type	Credits	Grading	Term offered	Version
Oral examination	4,5 CP	graded	Each term	1

Courses					
WT 25/26	2115817	Project Workshop: Automotive Engineering	3 SWS	Lecture / 🗣	Gießler, Frey
ST 2026	2115817	Project Workshop: Automotive Engineering	3 SWS	Lecture / 🗣	Gießler, Frey
Exams					
WT 25/26	76-T-MACH-102156	Project Workshop: Automotive Engineering			Gauterin

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral examination

Duration: duration 30 up to 40 minutes

Auxiliary means: none

Prerequisites
none

Workload
180 hours

Below you will find excerpts from courses related to this module component:

V Project Workshop: Automotive Engineering
2115817, WS 25/26, 3 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
During the Project Workshop Automotive Engineering a team of six persons will work on a task given by an German industrial partner using the instruments of project management. The task is relevant for the actual business and the results are intended to be industrialized after the completion of the project workshop.

The team will generate approaches in its own responsibility and will develop solutions for practical application. Coaching will be supplied by both, company and institute.

At the beginning in a start-up meeting goals and structure of the project will be specified. During the project workshop there will be weekly team meetings. Also a milestone meeting will be held together with persons from the industrial company. In a final presentation the project results will be presented to the company management and to institute representatives.

Learning Objectives:

During the Project Workshop Automotive Engineering a team of six persons will work on a task given by an German industrial partner using the instruments of project management. The task is relevant for the actual business and the results are intended to be industrialized after the completion of the project workshop.

The team will generate approaches in its own responsibility and will develop solutions for practical application. Coaching will be supplied by both, company and institute.

At the beginning in a start-up meeting goals and structure of the project will be specified. During the project workshop there will be weekly team meetings. Also a milestone meeting will be held together with persons from the industrial company. In a final presentation the project results will be presented to the company management and to institute representatives.

Organizational issues
Begrenzte Teilnehmerzahl mit Auswahlverfahren, in deutscher Sprache. Bewerbungen sind am Ende des vorhergehenden Semesters einzureichen.
Termin und Raum: siehe Institutshomepage.

Limited number of participants with selection procedure, in German language. Please send the application at the end of the previous semester

Date and room: see homepage of institute.

Literature
Steinle, Claus; Bruch, Heike; Lawa, Dieter (Hrsg.), Projektmanagement, Instrument moderner Innovation, FAZ Verlag, Frankfurt a. M., 2001, ISBN 978-3929368277

Skripte werden beim Start-up Meeting ausgegeben.

The scripts will be supplied in the start-up meeting.

V **Project Workshop: Automotive Engineering**
2115817, SS 2026, 3 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
During the Project Workshop Automotive Engineering a team of six persons will work on a task given by an German industrial partner using the instruments of project management. The task is relevant for the actual business and the results are intended to be industrialized after the completion of the project workshop.

The team will generate approaches in its own responsibility and will develop solutions for practical application. Coaching will be supplied by both, company and institute.

At the beginning in a start-up meeting goals and structure of the project will be specified. During the project workshop there will be weekly team meetings. Also a milestone meeting will be held together with persons from the industrial company. In a final presentation the project results will be presented to the company management and to institute representatives.

Learning Objectives:

The students are familiar with typical industrial development processes and working style. They are able to apply knowledge gained at the university to a practical task. They are able to analyze and to judge complex relations. They are ready to work self-dependently, to apply different development methods and to work on approaches to solve a problem, to develop practice-oriented products or processes.

Organizational issues
Begrenzte Teilnehmerzahl mit Auswahlverfahren, die Bewerbungen sind am Ende des vorhergehenden Semesters einzureichen.

Raum und Termine: s. Aushang bzw. Homepage

Literature

Steinle, Claus; Bruch, Heike; Lawa, Dieter (Hrsg.), Projektmanagement, Instrument moderner Innovation, FAZ Verlag, Frankfurt a. M., 2001, ISBN 978-3929368277

Skripte werden beim Start-up Meeting ausgegeben.

T 7.209 Module component: Project: Data-Driven Engineering Fundamentals [T-MACH-115010]

Coordinators: Prof. Dr.-Ing. Anne Meyer
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-107658 - Data Driven Engineering Fundamentals

Type	Credits	Grading	Term offered	Expansion	Version
Examination of another type	4 CP	graded	Each term	1 semesters	1

Courses					
ST 2026	2122354	Project: Data-Driven Engineering Fundamentals	4 SWS	Project / 🗣	Meyer

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Graded examination of aother type. The following aspects are included in the grade:

- Documentation of the project implementation
- Achievement of the project goals
- Intermediate presentations and final presentation including live demonstration

The overall impression is assessed. The grading scale will be announced in the course.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Project: Data-Driven Engineering Fundamentals

2122354, SS 2026, 4 SWS, Language: English, Open in study portal

Project (PRO)
On-Site

Content

Modern engineering increasingly relies on data-driven solutions across domains such as product design, production systems, logistics, and robotics. To address these developments, this project-based course enables students to work in small teams on a data-driven engineering problem in one of the domains.

The focus is on collaboratively structuring and solving an open-ended task, organizing project work, and selecting or combining suitable methods from machine learning, optimization, and simulation. Students use state-of-the-art tools and software libraries for data-driven engineering applications (depending on the task, e.g., Isaac Sim, PyTorch, ROS2, Gymnasium) to develop, implement, and evaluate a prototypical solution. Students document their work and communicate their results through presentations and suitable media formats.

The course is designed as an on-site project with regular in-person collaboration and supervision. Familiarity with Python programming is strongly recommended. Students should be open to learning and working with operating systems and tools such as Linux, Docker, and Git.

Learning Objectives

After successful completion of the course, students will be able to:

- **Analyze and formulate** an open-ended engineering problem as a data-driven task and select appropriate methods from machine learning, optimization, and simulation.
- **Design, implement, and manage** a team-based project workflow, including task allocation, milestone planning, and effective team communication, using modern tools and software libraries for data-driven engineering applications.
- **Evaluate and communicate** project results effectively to different audiences using appropriate formats, including technical presentations, pitch-style formats, and short project videos.

Additional Information

The number of participants is limited. Information on the application process is available in ILIAS.

Organizational Information

See further details on course organization at: lehre.imi.kit.edu and in ILIAS.

Workload

120 hours

Organizational issues

See ILIAS for time and location / Zeit und Ort siehe ILIAS

7.210 Module component: Public Law I & II [T-INFO-110300]

Coordinators: TT-Prof. Dr. Frederike Zufall
Organisation: KIT Department of Informatics
Part of: M-INFO-105084 - Public and Civil Law

Type	Credits	Grading	Term offered	Version
Written examination	6 CP	graded	Each summer term	1

Courses					
WT 25/26	2424016	Öffentliches Recht I - Grundlagen	2 SWS	Lecture / 🗣	Zufall
ST 2026	24520	Öffentliches Recht II - Öffentliches Wirtschaftsrecht	2 SWS	Lecture / 🗣	Zufall
Exams					
WT 25/26	7500138	Public Law I & II			Zufall
ST 2026	7500298	Public Law I & II			Zufall

Legend: 🖥 Online, ✿ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 7.211 Module component: Public Revenues [T-WIWI-102739]

Coordinators: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101403 - Public Finance
M-WIWI-101499 - Applied Microeconomics
M-WIWI-101668 - Economic Policy I

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	1

Courses					
ST 2026	2560120	Public Revenues	2 SWS	Lecture / 🗣	Wigger
ST 2026	2560121	Übung zu Öffentliche Einnahmen	1 SWS	Practice / 🗣	Wigger, Schmelzer
Exams					
WT 25/26	790oeff	Public Revenues			Wigger
ST 2026	790oeff	Public Revenues			Wigger

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Success is assessed in the form of a written examination (60 minutes). The examination is offered every semester and can be repeated at any regular examination date.

Prerequisites
None

Recommendations
Basic knowledge of Public Finance is required.

Below you will find excerpts from courses related to this module component:

V Public Revenues

2560120, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The *Public Revenues* lecture is concerned with the theory and policy of taxation and public dept. In the first chapter, fundamental concepts of taxation theory are introduced, whereas the second chapter deals with key elements of the German taxation system. The allocative and distributive effects of different taxation types are examined in chapter three and four. Chapter five integrates both allocative and distributive components in order to derive a theory of optimal taxation. The core of the sixth chapter is represented by international aspects of taxation. The debt part begins with a description of the extent and structure of public dept in chapter seven. In the following chapter, macroeconomic theories of national dept are evolved, while chapter nine is concerned with its long term consequences when employed as a regular instrument of budgeting. Finally, the tenth chapter deals with constitutional limits to public debt-incurring.

Learning goals:

See German version.

Workload:

The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Literatur:

- Homburg, S.(2000): *Allgemeine Steuerlehre*, Vahlen
- Rosen, H.S.(1995): *Public Finance*; 4. Aufl., Irwin
- Wellisch, D.(2000): *Finanzwissenschaft I* und *Finanzwissenschaft III*, Vahlen
- Wigger, B. U.(2006): *Grundzüge der Finanzwissenschaft*; 2. Aufl., Springer

T 7.212 Module component: Python Algorithms for Vehicle Technology [T-MACH-110796]

Coordinators: Stephan Rhode
Organisation:
Part of: M-MACH-101265 - Vehicle Development
M-MACH-101266 - Automotive Engineering

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	graded	Each summer term	1

Courses					
ST 2026	2114862	Python Algorithms for Automotive Engineering	2 SWS	Lecture /	Rhode
Exams					
WT 25/26	76-T-Mach-110796	Python Algorithm for Vehicle Technology			Rhode
ST 2026	76-T-MACH-110796	Python Algorithm for Vehicle Technology			Rhode

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Written Examination

Duration: 90 minutes

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Python Algorithms for Automotive Engineering

2114862, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Content

Teaching content:

- Introduction to Python and useful tools and libraries for creating algorithms, graphical representation, optimization, symbolic arithmetic and machine learning
  - Anaconda, Pycharm, Jupyter
  - NumPy, Matplotlib, SymPy, Scikit-Learn
- Methods and tools for creating software
  - Version management GitHub, git
  - Testing software pytest, Pylint
  - Documentation Sphinx
  - Continuous Integration (CI) Travis CI
  - Workflows in Open Source and Inner Source, Kanban, Scrum
- Practical programming projects to:
  - Road sign recognition
  - Vehicle state estimation
  - Calibration of vehicle models by mathematical optimization
  - Data-based modelling of the powertrain of an electric vehicle

Objectives:

The students have an overview of the programming language Python and important Python libraries to solve automotive engineering problems with computer programs. The students know current tools around Python to create algorithms, to apply them and to interpret and visualize their results. Furthermore, the students know
basics in the creation of software to be used in later programming projects in order to develop high-quality software solutions in teamwork. Through practical programming projects (road sign recognition, vehicle state estimation, calibration, data-based modelling), the students can perform future complex tasks from the area of driver assistance systems.

Organizational issues

Die Vorlesung beginnt mit zwei Kick-Off Veranstaltung in Präsenz am Campus Ost, Geb.70.04, Raum 219. Die entsprechenden Temrine werden noch bekannt gegeben. Die restlichen Termine finden überwiegend digital statt. Weitere Infos über ILIAS.

Literature

- A Whirlwind Tour of Python, Jake VanderPlas, Publisher: O'Reilly Media, Inc. Release Date: August 2016, ISBN: 9781492037859 link
- Scientific Computing with Python 3, Olivier Verdier, Jan Erik Solem, Claus Führer, Publisher: Packt Publishing, Release Date: December 2016, ISBN: 9781786463517 link
- Introduction to Machine Learning with Python, Sarah Guido, Andreas C. Müller, Publisher: O'Reilly Media, Inc., Release Date: October 2016, ISBN: 9781449369880, link
- Clean Code, Robert C. Martin, Publisher: Prentice Hall, Release Date: August 2008, ISBN: 9780136083238, link

T 7.213 Module component: Python-Basics Course [T-MACH-115104]

Coordinators: Prof. Dr.-Ing. Anne Meyer
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-107658 - Data Driven Engineering Fundamentals

Type	Credits	Grading	Term offered	Expansion	Version
Coursework	1 CP	pass/fail	Each winter term	1 semesters	1

Assessment
Successful participation in a colloquium in individual performance at the end of the Python course.

Additional Information
Self-study course with on-site assessment

Workload
30 hours

T 7.214 Module component: Quality Management [T-MACH-102107]

Coordinators: Prof. Dr.-Ing. Gisela Lanza
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	graded	Each winter term	4

Courses					
WT 25/26	2149667	Quality Management	2 SWS	Lecture / Blended	Lanza, Benfer
Exams					
WT 25/26	76-T-MACH-102107	Quality Management			Lanza

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Written Exam (60 min)

Prerequisites
It is not possible to combine this module component with module component Quality Management [T-MACH-112586].

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Quality Management

2149667, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
Blended (On-Site/Online)

Content
Based on the quality philosophies Total Quality Management (TQM) and Six Sigma, the lecture deals with the requirements of modern quality management. Within this context, the process concept of a modern enterprise and the process-specific fields of application of quality assurance methods are presented. The lecture covers the current state of the art in preventive and non-preventive quality management methods in addition to manufacturing metrology, statistical methods and service related quality management. The content is completed with the presentation of certification possibilities and legal quality aspects.

Main topics of the lecture:

- The term "Quality"
- Total Quality Management (TQM) and Six Sigma
- Universal methods and tools
- QM during early product stages – product denition
- QM during product development and in procurement
- QM in production – manufacturing metrology
- QM in production – statistical methods
- QM in service
- Quality management systems
- Legal aspects of QM

Learning Outcomes:

The students …

- are capable to comment on the content covered by the lecture.
- are capable of substantially quality philosophies.
- are able to apply the QM tools and methods they have learned about in the lecture to new problems from the context of the lecture.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about in the lecture for a specific problem.

Workload:

regular attendance: 21 hours
self-study: 99 hours

Organizational issues
Vorlesungstermine montags 09:45 Uhr
Übung erfolgt während der Vorlesung

Literature
Medien:
Skript zur Veranstaltung wird über (https://ilias.studium.kit.edu/) bereitgestellt:

Media:
Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/).

T 7.215 Module component: Quantitative Finance [T-WIWI-114340]

Coordinators: Prof. Dr. Julian Thimme
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2500065	Quantitative Finance	2 SWS	Lecture / 🗣	Thimme, Meng
Exams					
WT 25/26	7900114	Quantitative Finance			Thimme

Legend: 🖥 Online, 🔄 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment of success in this course is carried out as a non exam assessment. The grade is made up as follows:

1. Written elaboration (weighting: 33 %).
2. Working on and presenting data analysis problems in small groups (weighting: 67 %).

Prerequisites
None

Recommendations
Knowledge from the course Business Administration: Finance and Accounting [2610026] is very helpful.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Quantitative Finance

2500065, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
In Quantitative Finance, participants gain in-depth knowledge of analyzing corporate and financial market data to methodically explore key questions in finance. The course begins with a brief introduction to the Python programming language and the development environment used throughout the course. Following this, seven thematically structured modules cover both fundamental issues in finance and the associated empirical analytical methods. In three hackathons, participants work in small teams with real datasets to apply the theoretical concepts to concrete problems and subsequently present their findings.

Organizational issues
findet in der ersten Semesterhälfte statt

T 7.216 Module component: Rail System Technology [T-MACH-106424]

Coordinators: Prof. Dr.-Ing. Martin Cichon
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-107717 - Rail System Technology and Rail Vehicle Technology

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each term	5

Courses					
WT 25/26	2115919	Rail System Technology	2 SWS	Lecture / 🗣	Cichon
ST 2026	2115919	Rail System Technology	2 SWS	Lecture / 🗣	Cichon
Exams					
WT 25/26	76-T-MACH-106424	Rail System Technology			Cichon
ST 2026	76-T-MACH-106424	Rail System Technology			Cichon

Legend: 🖥 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
writen examination in German language
Duration: 60 minutes
No tools or reference materials may be used during the exam except calculator and dictionary

Prerequisites
none

Additional Information
The course is offered in German.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Rail System Technology

2115919, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

1. Railway System: railway as system, subsystems and interdependencies, definitions, laws, rules, railway and environment, economic impact
2. Operation: Transportation, public transport, regional transport, long-distance transport, freight service, scheduling
3. Infrastructure: rail facilities, track alignment, railway stations, clearance diagram
4. Wheel-rail-contact: carrying of vehicle mass, adhesion, wheel guidance, current return
5. Vehicle dynamics: tractive and brake effort, driving resistance, inertial force, load cycles
6. Signaling and Control: operating procedure, succession of trains, European Train Control System, blocking period, automatic train control
7. Traction power supply: power supply of rail vehicles, comparison electric traction and diesel traction, dc and ac networks, system pantograph and contact wire, filling stations

Literature
Eine Literaturliste steht den Studierenden auf der Ilias-Plattform zum Download zur Verfügung.

A bibliography is available for download (Ilias-platform).

V Rail System Technology

2115919, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

1. Railway System: railway as system, subsystems and interdependencies, definitions, laws, rules, railway and environment, economic impact
2. Operation: Transportation, public transport, regional transport, long-distance transport, freight service, scheduling
3. Infrastructure: rail facilities, track alignment, railway stations, clearance diagram
4. Wheel-rail-contact: carrying of vehicle mass, adhesion, wheel guidance, current return
5. Vehicle dynamics: tractive and brake effort, driving resistance, inertial force, load cycles
6. Signaling and Control: operating procedure, succession of trains, European Train Control System, blocking period, automatic train control
7. Traction power supply: power supply of rail vehicles, comparison electric traction and diesel traction, dc and ac networks, system pantograph and contact wire, filling stations

Organizational issues

schriftliche Prüfung, der Termin steht noch nicht fest

Literature

Eine Literaturliste steht den Studierenden auf der Ilias-Plattform zum Download zur Verfügung.

A bibliography is available for download (Ilias-platform).

T 7.217 Module component: Rail Vehicle Technology [T-MACH-105353]

Coordinators: Prof. Dr.-Ing. Martin Cichon
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-107717 - Rail System Technology and Rail Vehicle Technology

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each term	5

Courses					
WT 25/26	2115996	Rail Vehicle Technology	2 SWS	Lecture / 🗣	Cichon
ST 2026	2115996	Rail Vehicle Technology	2 SWS	Lecture / 🗣	Cichon
Exams					
WT 25/26	76-T-MACH-105353	Rail Vehicle Technology			Cichon
ST 2026	76-T-MACH-105353	Rail Vehicle Technology			Cichon

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
writen examination in German language
Duration: approx 60 minutes
No tools or reference materials may be used during the exam except calculator and dictionary

Prerequisites
none

Additional Information
The course is offered in German.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Rail Vehicle Technology

2115996, WS 25/26, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

1. Vehicle system technology: structure and main systems of rail vehicles
2. Car body: functions, requirements, design principles, crash elements, coupling, doors and windows
3. Bogies: forces, running gears, bogies, Jakobs-bogies, active components, connection to car body, wheel arrangement
4. Drives: priciples, electric drives (main components, asynchronous traction motor, inverter, with DC supply, with AC supply, without line supply, multisystem vehicles, dual mode vehicles, hybrid vehicles), non-electric drives
5. Brakes: basics, principles (wheel brakes, rail brakes, blending), brake control (requirements and operation modes, pneumatic brake, electropneumatic brake, emergency brake, parking brake)
6. Train control management system: definition of TCMS, bus systems, components, network architectures, examples, future trends
7. Vehicle concepts: trams, metros, regional trains, intercity trains, high speed trains, double deck vehicles, locomotives, freight wagons

Literature
Eine Literaturliste steht den Studierenden auf der Ilias-Plattform zum Download zur Verfügung.

A bibliography is available for download (Ilias-platform).

V Rail Vehicle Technology

2115996, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

1. Vehicle system technology: structure and main systems of rail vehicles
2. Car body: functions, requirements, design principles, crash elements, coupling, doors and windows
3. Bogies: forces, running gears, bogies, Jakobs-bogies, active components, connection to car body, wheel arrangement
4. Drives: priciples, electric drives (main components, asynchronous traction motor, inverter, with DC supply, with AC supply, without line supply, multisystem vehicles, dual mode vehicles, hybrid vehicles), non-electric drives
5. Brakes: basics, principles (wheel brakes, rail brakes, blending), brake control (requirements and operation modes, pneumatic brake, electropneumatic brake, emergency brake, parking brake)
6. Train control management system: definition of TCMS, bus systems, components, network architectures, examples, future trends
7. Vehicle concepts: trams, metros, regional trains, intercity trains, high speed trains, double deck vehicles, locomotives, freight wagons

Organizational issues
schriftliche Prüfung, der Termin steht noch nicht fest

Literature
Eine Literaturliste steht den Studierenden auf der Ilias-Plattform zum Download zur Verfügung.

A bibliography is available for download (Ilias-platform).

T 7.218 Module component: Rapid Industrialization of Immature Products using the Example of Electric Mobility [T-MACH-113031]

Coordinators: Dr. Jörg Bauer
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	4 CP	graded	Each winter term	1 semesters	1

Courses					
WT 25/26	2149621	Rapid Industrialization of Immature Products using the Example of Electric Mobility	2 SWS	Lecture / 🗣	Bauer
Exams					
WT 25/26	76-T-MACH-113031	Rapid Industrialization of Immature Products using the Example of Electric Mobility			Bauer

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Written Exam (60 min)

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Rapid Industrialization of Immature Products using the Example of Electric Mobility

Lecture (V)
On-Site

2149621, WS 25/26, 2 SWS, Language: German, Open in study portal

Content

The lecture "Rapid Industrialization of Immature Products using the Example of Electric Mobility" deals with production engineering methods for the robust and cost-effective production of technologically novel, so-called "immature" products. In this context, approaches for solving the central challenges resulting from the tension triangle of product development, industrialization and production are identified and discussed.

Based on the motivation for rapid market entry, the current approach involving stakeholders and other participants is explained. On this basis, key enablers for rapid and targeted industrialization are derived and discussed. For example, robust industrial processes based on flexible equipment are an essential core element for cost-effective production. Against this background, industry-relevant concepts for the automation and flexibilization of production processes are presented in the lecture in order to be able to deal efficiently and effectively with product-specific changes on the production side. Therefore, the main goal of an industrialization process is to develop production technologies and processes that enable robust, resource-efficient and cost-effective manufacturing of established and innovative products.

The lecture is structured as follows:

1. Motivation for rapid industrialization (complex market requirements, shortened development and product cycles, decreasing quantities per variant, ...).
2. Industrialization methods (simultaneous engineering, releases, frozen zones, high volumes, ...)
3. Key enablers to accelerate industrialization (simulation and digitalization, flexible and digital production equipment
4. Supply chains and suppliers
5. Testing and deployment
6. Ramp-up

Learning Outcomes:

- The students are familiar with the essential elements of simultaneous engineering and industrialization (motivation, processes, fields of action, challenges).
- The Students know the key enablers for the rapid industrialization of immature products (digitization, flexible production equipment, rapid manufacturing processes for primary production).
- The Students are familiar with the basic principles, methods and procedures of the main enablers. The understanding is deepened through theory, case and practical examples.
- The toolbox of key enablers described in the lecture allows students to select and independently apply the enablers in the context of future challenges.
- The Students are able to disseminate and to apply the knowledge acquired during the lecture in their future working lives.

Workload:

regular attendance: 21 hours
self-study: 99 hours

Organizational issues

Blockvorlesung vom 03.11.2025 bis 07.11.2025, täglich von 14:00 bis 19:00 Uhr in der Karlsruher Forschungsfabrik 70.41. Die theoretischen Inhalte der Vorlesung werden durch praktische Aufbauten in der Karlsruher Forschungsfabrik veranschaulicht. Vorlesungsunterlagen und weitere Informationen werden über ILIAS (https://ilias.studium.kit.edu/) zur Verfügung gestellt.

Block course from 03.11.2025 to 07.11.2025, daily from 14:00 to 19:00 in the Karlsruhe Research Factory 70.41. The theoretical contents of the lecture will be illustrated by practical setups in the Karlsruhe Research Factory. Lecture notes and further information will be made available via ILIAS (https://ilias.studium.kit.edu/).

Literature

Foliensatz zur Veranstaltung wird über Ilias (https://ilias.studium.kit.edu/) bereitgestellt.

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/).

T 7.219 Module component: Remote Sensing, Exam [T-BGU-101636]

Coordinators: Prof. Dr. Jan Cermak
Prof. Dr.-Ing. Stefan Hinz
Dr.-Ing. Uwe Weidner
Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences
Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each term	2

Courses					
ST 2026	6020241	Remote Sensing Systems	1 SWS	Lecture / 🗣	Hinz, Cermak
ST 2026	6020242	Remote Sensing Systems, Excercise	1 SWS	Practice / 🗣	Pauli
ST 2026	6020243	Procedures of Remote Sensing	2 SWS	Lecture / 🗣	Weidner
ST 2026	6020244	Procedures of Remote Sensing, Excercise	1 SWS	Practice / 🗣	Weidner
Exams					
WT 25/26	8284101636	Remote Sensing, exam			Hinz, Weidner

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Recommendations
None

Workload
120 hours

T 7.220 Module component: Renewable Energy-Resources, Technologies and Economics [T-WIWI-100806]

Coordinators: Prof. Dr. Patrick Jochem
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101464 - Energy Economics

Type	Credits	Grading	Term offered	Version
Written examination	3,5 CP	graded	Each winter term	8

Courses					
WT 25/26	2581012	Renewable Energy – Resources, Technologies and Economics	2 SWS	Lecture / 🗣	Jochem
Exams					
WT 25/26	7981012	Renewable Energy-Resources, Technologies and Economics			Fichtner
ST 2026	7981012	Renewable Energy-Resources, Technologies and Economics			Fichtner

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment consists of a written exam (60 minutes, in English, answers are possible in German or English) (following §4(2) of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None.

Below you will find excerpts from courses related to this module component:

V Renewable Energy – Resources, Technologies and Economics

2581012, WS 25/26, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
1. General introduction: Motivation, Global situation

2. Basics of renewable energies: Energy balance of the earth, potential definition

3. Hydro

4. Wind

5. Solar

6. Biomass

7. Geothermal

8. Other renewable energies

9. Promotion of renewable energies

10. Interactions in systemic context

11. Excursion to the "Energieberg" in Mühlburg

Learning Goals:

The student

- understands the motivation and the global context of renewable energy resources.
- gains detailed knowledge about the different renewable resources and technologies as well as their potentials.
- understands the systemic context and interactions resulting from the increased share of renewable power generation.
- understands the important economic aspects of renewable energies, including electricity generation costs, political promotion and marketing of renewable electricity.
- is able to characterize and where required calculate these technologies.

Literature
Weiterführende Literatur:

- Quaschning, V. (2019), Regenerative Energiesysteme, Technologie - Berechnung – Klimaschutz, Carl Hanser Verlag München
- Quaschning, V. (2016), Understanding Renewable Energy Systems, Earthscan/Routledge London.
- Infield, D. & Freris, L. (2020), Renewable Energy in Power Systems
- Jenkins, N. & Ekanayake, J. (2024), Renewable Energy Engineering
- Stutzmann, M. & Csoklich, C. (2024), The Physics of Renewable Energy
- Löschel et al. (2020), Energiewirtschaft – Einführung in Theorie und Politik
- Batic, M., Stanojevic, M. & Vranes, S. (2025), Renewable Energy Technologies
- Victoria, M. (2025), *Fundamentals of Solar Cells and Photovoltaic Systems Engineering*. Academic Press

T 7.221 Module component: Seminar Application of Artificial Intelligence in Production [T-MACH-112121]

Coordinators: Prof. Dr.-Ing. Jürgen Fleischer
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Examination of another type	4 CP	graded	Each summer term	5

Courses					
ST 2026	2150910	Seminar Application of Artificial Intelligence in Production	2 SWS	Seminar / 🗣	Fleischer

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Alternative test achievement (graded):

- Presentation of the results (approx. 20 min) followed by a colloquium (approx. 15 min) with weighting 25%
- Written processing of the results with weighting 75%

Prerequisites
none

Recommendations
Previous participation in the lecture 2149921 "Artificial Intelligence in Production" or advanced knowledge of Python.

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Seminar Application of Artificial Intelligence in Production

2150910, SS 2026, 2 SWS, Language: German, Open in study portal

Seminar (S)
On-Site

Content

The module AI in Production is designed to teach students the practical, holistic integration of machine learning methods and the application of artificial intelligence in production. The course is based on the phases of the CRISP-DM process with the aim of developing a deep understanding of the necessary steps and content aspects (methods) within the individual phases. In addition to teaching the practice-relevant aspects for integrating the most important methods of machine learning, the focus here is primarily on the necessary steps for data generation and data preparation, as well as the implementation and safeguarding of the methods in an industrial environment.

The lecture “Seminar on the Application of Artificial Intelligence in Production” aims at the practical integration of current methods of machine learning using realistic industrial use cases. The content of the course is based on the holistic, practical implementation of an AI project in production. In doing so, students solve a problem from a production context using methods of data analysis, processing and machine learning.

Learning Outcomes:

The students

- are able to independently analyze a practical problem in production with regard to the application of machine learning methods.
- will be able to independently apply common deep learning algorithms to practical data sets, validate them, and analyze the results.
- understand the challenges of using deep learning methods in production.
- will know the main action areas and open research questions for the successful implementation of AI in production and for the implementation of autonomous machines.
- are able to evaluate the results of current deep learning methods and, based on these, to develop and practically apply proposed solutions (from the field of machine learning).

Workload:

regular attendance: 21 hours
self-study: 99 hours

Organizational issues

Auftaktveranstaltung am 24.04.2026, 8:00 - 9:30 Uhr im Vorlesungsbereich der Karlsruher Forschungsfabrik (Geb. 70.41).

Alle nachfolgenden Termine werden über Ilias (https://ilias.studium.kit.edu/) bekanntgegeben.

Literature

Materialien zur Lehrveranstaltung werden über Ilias (https://ilias.studium.kit.edu/) bereitgestellt.

Course materials will be provided onIlias (https://ilias.studium.kit.edu/).

T 7.222 Module component: Seminar Data-Mining in Production [T-MACH-108737]

Coordinators: Prof. Dr.-Ing. Gisela Lanza
Organisation: KIT Department of Mechanical Engineering

Part of: M-WIWI-101816 - Seminar Module

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each winter term	2

Courses					
WT 25/26	2151643	Seminar Data Mining in Production	2 SWS	Seminar / 🗣	Lanza
Exams					
WT 25/26	76-T-MACH-108737	Seminar Data-Mining in Production			Lanza

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
alternative test achievement (graded):

- written elaboration (workload of at least 80 h)
- oral presentation (approx. 30 min)

Prerequisites
none

Additional Information
The course is offered in German.

The number of students is limited to twelve. Dates and deadlines for the seminar will be announced at https://www.wbk.kit.edu/studium-und-lehre.php.

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V Seminar Data Mining in Production

2151643, WS 25/26, 2 SWS, Language: German, Open in study portal

Seminar (S)
On-Site

Content
In the age of Industry 4.0, large amounts of production data are generated by the global production networks and value chains. Their analysis enables valuable conclusions about production and lead to an increasing process efficiency. The aim of the seminar is to get to know production data analysis as an important component of future industrial projects. The students get to know the data mining tool KNIME and use it for analyses. A specific industrial use case with real production data enables practical work and offers direct references to industrial applications. The participants learn selected methods of data mining and apply them to the production data. The work within the seminar takes place in small groups on the computer. Subsequently, presentations on specific data mining methods have to be prepared.

Learning Outcomes:

The students ...

- can name, describe and distinguish between different methods, procedures and techniques of production data analysis.
- can perform basic data analyses with the data mining tool KNIME.
- can analyze and evaluate the results of data analyses in the production environment.
- are able to derive suitable recommendations for action.
- are able to explain and apply the CRISP-DM model.

Workload:

regular attendance: 10 hours
self-study: 80 hours

Organizational issues
Die Teilnehmerzahl ist auf zwölf Studierende begrenzt. Termine und Fristen zur Veranstaltung werden unter https://www.wbk.kit.edu/studium-und-lehre.php bekanntgegeben.

The number of students is limited to twelve. Dates and deadlines for the seminar will be announced at https://www.wbk.kit.edu/studium-und-lehre.php.

Literature
Medien:
KNIME Analytics Platform

Media:
KNIME Analytics Platform

T 7.223 Module component: Seminar in Business Administration (Bachelor) [T-WIWI-103486]

Coordinators: Professorenschaft des Fachbereichs Betriebswirtschaftslehre
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101816 - Seminar Module

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each term	1

Courses					
WT 25/26	2500045	Digital Democracy - Challenges and Opportunities of the Digital Society	2 SWS	Seminar /	Fegert, Stein, Bezzaoui
WT 25/26	2500061	Special Topics in Transportation Strategy	2 SWS	Seminar /	Müller
WT 25/26	2500067	Seminar in Electrogastrogram and Economic Decision Making	2 SWS	Seminar /	Dharmapalan, Scheibehenne
WT 25/26	2500125	Human-Centered Systems Seminar: Engineering	2 SWS	Seminar /	Mädche
WT 25/26	2530580	Seminar in Finance (Bachelor)	2 SWS	Seminar /	Uhrig-Homburg, Thimme
WT 25/26	2530586		2 SWS	Seminar /	Uhrig-Homburg, Molnar
WT 25/26	2530610	Seminar in Financial Economics (Bachelor)	2 SWS	Seminar /	Thimme
WT 25/26	2540471	Bachelor Seminar (Information Systems III) – Sustainable Economies / More Human-like Conversational Agents	2 SWS	Seminar /	Bennardo, Gutschow, Heßler
WT 25/26	2540473	Business Data Analytics	2 SWS	Seminar /	Hariharan, Grote, Schulz, Motz
WT 25/26	2540475	Positive Information Systems	2 SWS	Seminar /	Knierim, del Puppo
WT 25/26	2540478	Smart Grids and Energy Markets	2 SWS	Seminar /	Weinhardt, Semmelmann, Miskiw, Speck
WT 25/26	2540524	Bachelor Seminar in Data Science and Machine Learning	2 SWS	Seminar	Geyer-Schulz, Nazemi
WT 25/26	2540557	Human-Centered Systems Seminar: Research	2 SWS	Seminar /	Mädche
WT 25/26	2571180	Seminar in Marketing and Sales (Bachelor)	2 SWS	Seminar /	Klarmann
WT 25/26	2573010	Seminar: Human Resources and Organizations (Bachelor)	2 SWS	Seminar /	Nieken, Mitarbeiter
WT 25/26	2573011	Seminar: Human Resource Management (Bachelor)	2 SWS	Seminar /	Nieken, Mitarbeiter
WT 25/26	2579919	Seminar Management Accounting - Sustainability Topics	2 SWS	Seminar /	Wouters, Dickemann
WT 25/26	2581030	Seminar in Energy Economics	2 SWS	Seminar /	Fichtner, Sloot
WT 25/26	2581032	Seminar Energy Economics VI	2 SWS	Seminar /	Fichtner, Slednev
WT 25/26	2581976	Seminar in Production and Operations Management I	2 SWS	Seminar /	Schultmann, Rudi
WT 25/26	2581977	Seminar in Production and Operations Management II	2 SWS	Seminar /	Schultmann, Steins
WT 25/26	2581978	Seminar in Production and Operations Management	2 SWS	Seminar /	Schultmann, Rosenberg
WT 25/26	2581979	Seminar in Energy Economics	2 SWS	Seminar /	Fichtner, Kleinebrahm

WT 25/26	2581980	Seminar in Energy Economics	2 SWS	Seminar /	Fichtner, Sandmeier
WT 25/26	2581981	Seminar in Energy Economics	2 SWS	Seminar /	Ardone, Fichtner
ST 2026	2500020	Digital Democracy - Challenges and opportunities of the digital society	2 SWS	Seminar /	Fegert
ST 2026	2500061	Special Topics in Transportation Strategy	2 SWS	Seminar /	Müller
ST 2026	2500125	Human-Centered Systems Seminar: Engineering	3 SWS	Seminar /	Mädche
ST 2026	2530293	Seminar in Finance (Bachelor, Prof. Ruckes)	2 SWS	Seminar /	Ruckes, Luedecke, Benz, Kohl, Sarac, Fkyerat
ST 2026	2530610	Seminar Financial Economics	2 SWS	Seminar /	Thimme
ST 2026	2540468	Bachelor Seminar: Intelligent & Responsible Information Systems	2 SWS	Seminar /	Pfeiffer, Schlaich
ST 2026	2540473	Applied Responsible AI	2 SWS	Seminar	Schulz, Weinhardt
ST 2026	2540475	Positive Information Systems	2 SWS	Seminar	Knierim
ST 2026	2540478	Smart Grid Economics & Energy Markets	2 SWS	Seminar	Weinhardt
ST 2026	2540524	Bachelor Seminar in Data Science and Machine Learning	2 SWS	Seminar	Geyer-Schulz
ST 2026	2540553	Biosignal-Adaptive Systems Seminar	2 SWS	Seminar /	Mädche, Beigl
ST 2026	2540557	Human-Centered Systems Seminar: Research	3 SWS	Seminar /	Mädche
ST 2026	2571187	Seminar Digital Marketing (Bachelor)	2 SWS	Seminar /	Kupfer
ST 2026	2573010	Seminar Human Resources and Organizations (Bachelor)	2 SWS	Seminar /	Nieken, Mitarbeiter
ST 2026	2573011	Seminar Human Resource Management (Bachelor)	2 SWS	Seminar /	Nieken, Mitarbeiter, Gorny
ST 2026	2581030	Seminar Energiewirtschaft IV	2 SWS	Seminar /	Fichtner, Sloot
ST 2026	2581031	Seminar Energiewirtschaft V	2 SWS	Seminar /	Plötz
ST 2026	2581032	Seminar Energiewirtschaft VI	2 SWS	Seminar /	Slednev, Fichtner
ST 2026	2581978	Seminar Produktionswirtschaft und Logistik III	2 SWS	Seminar /	Schultmann, Rosenberg
ST 2026	2581979	Seminar Energiewirtschaft I	2 SWS	Seminar /	Fichtner, Kleinebrahm
ST 2026	2581980	Seminar Energiewirtschaft II	2 SWS	Seminar /	Fichtner, Sandmeier
ST 2026	2581981	Seminar Energiewirtschaft III	2 SWS	Seminar /	Ardone, Fichtner
Exams					
WT 25/26	00072	Seminar Positive Information Systems			Weinhardt
WT 25/26	00074	Seminar Business Data Analytics			Weinhardt
WT 25/26	7900017	Seminar Smart Grid and Energy Markets			Weinhardt
WT 25/26	7900069	Human-Centered Systems Seminar: Engineering			Mädche
WT 25/26	7900129	Special Topics in Transportation Strategy			Lindstädt
WT 25/26	7900138	Seminar in Marketing and Sales (Bachelor)			Klarmann
WT 25/26	7900157	Seminar Human Resources and Organizations (Bachelor)			Nieken
WT 25/26	7900161	Seminar Human Resource Management (Bachelor)			Nieken
WT 25/26	7900168	Bachelor Seminar in Data Science and Machine Learning			Geyer-Schulz
WT 25/26	7900175	Seminar in Finance: The Influence of Retail Traders on Options Markets			Uhrig-Homburg
WT 25/26	7900203	Seminar "Finance in a nutshell"			Uhrig-Homburg
WT 25/26	7900233	Human-Centered Systems Seminar: Research			Mädche
WT 25/26	7900315	Seminar Financial Economics: Podcast Seminar			Thimme
WT 25/26	7900328	Seminar in Energy Economics VI			Fichtner

WT 25/26	7900335	Seminar Energy Economics IV	Fichtner
WT 25/26	7900338	Seminar in Electrogastrogram and Economic Decision Making	Scheibehenne
WT 25/26	79-2579919-B	Seminar Management Accounting - Sustainability Topics (Bachelor)	Wouters
WT 25/26	7940468	Bachelor Seminar: Information Systems III	Pfeiffer
WT 25/26	7981976	Seminar in Production and Operations Management I	Schultmann
WT 25/26	7981977	Seminar in Production and Operations Management II	Schultmann
WT 25/26	7981978	Seminar in Production and Operations Management III	Schultmann
WT 25/26	7981979	Seminar Energy Economics I	Fichtner
WT 25/26	7981980	Seminar Energy Economics II	Fichtner
WT 25/26	7981981	Seminar Energy Economics III	Fichtner
ST 2026	7900003	Seminar in Finance (Bachelor, Prof. Ruckes)	Ruckes
ST 2026	7900100	Seminar Human Resource Management (Bachelor)	Nieken
ST 2026	7900190	Human-Centered Systems Seminar: Engineering	Mädche
ST 2026	7900230	Seminar Human Resources and Organizations (Bachelor)	Nieken
ST 2026	7900243	Seminar Digital Marketing (Bachelor)	Kupfer
ST 2026	7900261	Human-Centered Systems Seminar: Research	Mädche
ST 2026	7900265	Biosignal-Adaptive Systems Seminar	Mädche
ST 2026	7900326	Seminar Energy Economics VI	Fichtner
ST 2026	792581030	Seminar Energy Economics IV	Fichtner
ST 2026	792581031	Seminar Energy Economics V	Plötz
ST 2026	7940468	Bachelor Seminar: Intelligent & Responsible Information Systems	Pfeiffer
ST 2026	7981978	Seminar in Production and Operations Management III	Schultmann
ST 2026	7981979	Seminar Energy Economics I: A Real-Time Day-Ahead Energy Time Series Forecasting Challenge	Fichtner
ST 2026	7981980	Seminar Energy Economics II: Sustainable Transformation of Energy Infrastructures	Fichtner
ST 2026	7981981	Seminar Energy Economics III	Fichtner

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Additional Information
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: https://portal.wiwi.kit.edu.

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V **Seminar in Electrogastrogram and Economic Decision Making**
2500067, WS 25/26, 2 SWS, Language: English, Open in study portal

Seminar (S)
On-Site

Content

The gut is often referred to as the "second brain" due to its substantial influence on cognition, emotion regulation, and mental health. This concept is grounded in the gut-brain axis (GBA), the bidirectional communication network between the central nervous system (CNS) and the enteric nervous system (ENS). These systems interact through the autonomic nervous system (ANS), and the hypothalamic-pituitary-adrenal (HPA) axis, along with a complex network of neuroimmune and neuroendocrine mediators (The Gut-Brain Axis: Influence of Microbiota on Mood and Mental Health, 2018).

While much of the existing literature emphasizes the role of gut microbiota, which provides retrospective insight into gut function and mental health, real-time physiological measures of gut activity remain relatively underexplored. In this context, electrogastrography (EGG) — a non-invasive method for recording gastric myoelectric activity — offers a novel tool to investigate the dynamic interplay between gut physiology and mental states, including economic decision-making.

The use of EGG in cognitive neuroscience and behavioral science is still emerging, providing space for critical inquiry and methodological development. This seminar is designed to explore the landscape of EGG research from technical, theoretical, and applied perspectives.

Seminar Structure
The seminar is organized around five core thematic areas. Each student will choose one topic and develop a focused literature review that generates both technical knowledge and real-world application.

Topics
1. Gut-Brain Axis and the Basics of EGG
Goal: Introduce the physiological, theoretical, and conceptual background for why we want to measure gut signals.

This topic offers a deep dive into the anatomy and physiology of the gut-brain axis — including the enteric and autonomic nervous systems, interoceptive processing, and affective-body theories such as the somatic marker hypothesis, embodied emotion, and homeostasis. Students will also learn the basics of gastric myoelectric activity (slow waves, frequency bands) and what exactly EGG measures, in contrast to pressure sensors, motility tracking, or microbiota analysis.

Key Readings:

Mayer et al. (2015) – Gut-brain axis
Herbert & Pollatos (2012) – Interoception
Damasio (1996) – Somatic marker hypothesis
Koch & Stern (2004) – Basics of EGG

2. EGG Sensors, Signal Acquisition, and Processing
Goal: Understand the technical underpinnings of how EGG data is captured and analyzed.

This topic covers the sensor and hardware ecosystem for EGG, including types of electrodes, placements, and configurations. It explores wearable vs. lab-based systems, amplifier design, signal acquisition standards, and detailed signal processing techniques (e.g., filtering, artifact rejection, power analysis, and normogastria). The emphasis is on methodological rigor and the challenges of working with noisy physiological data.

Key Readings:

Gopu et al. (2010) – Signal processing in EGG
Stern et al. (2007)

3. EGG in Behavioral, Affective, and Clinical Research
Goal: Explore how EGG is used in real-world studies across behavioral and medical domains.

This topic focuses on empirical applications of EGG in behavioral science, affective research, and clinical diagnostics. Topics include EGG studies on emotion regulation, interoception, and cognitive tasks, as well as clinical research in IBS, gastroparesis (Hasler et al., 2004), nausea, and psychiatry. Students will critically assess limitations in sample sizes, interpretability, and translational potential.

Key Readings:

Vianna & Tranel (2006)
Wolpert et al. (2020)

4. EGG in Multimodal Biosignal Contexts and Future Directions
Goal: Position EGG among other biosignals and critically reflect on the field's limitations and future.

This module explores how EGG signal acquisition and processing compares to other biosignals such as ECG (heart rate variability), EDA (skin conductance), EEG (brain activity), and respiration in behavioural studies. Students will examine challenges of multimodal integration, signal synchrony, and interpretation. The topics include the use of wearables, AI-based classification, biofeedback, and the potential of open physiological datasets.

Key Readings:

Critchley et al. (2004)
Kim et al. (2021)
Wearable gut sensor papers - Vujic et al. (2020)

5. Multimodal Biosignals, Decision-Making, and Future Directions
Goal: Understand how EGG could capture aspects of decision-making in various contexts.

This topic explores the behavioral and cognitive implications of gut signals in decision-making tasks. Students will investigate studies linking gastric activity to risk-taking, delay discounting, and intuition, and how EGG data may reflect the visceral foundations of judgment. It also touches on EGG's potential in affective computing, real-time monitoring, and neuroeconomic models.

Key Readings:

Dunn et al. (2010)

Learning Outcomes
Throughout the course, students will sharpen key academic skills, including literature review and synthesis, critical analysis of research methods and findings, scientific writing, and clear communication of complex concepts. These skills will be developed through an in-depth exploration of electrogastrography (EGG), with a focus on its physiological and technological foundations, its relationship to gut-brain interactions, and its role in research on emotion, cognition, and decision-making. The course encourages students to engage critically with how EGG has been used so far, how it compares to other biosignals like ECG, EDA, and EEG, and how it might be applied in behavioural science and affective research. By the end of the seminar, students will contribute to a shared understanding of the field's current state, and reflect on future directions, challenges, and possibilities for applying EGG in both basic and applied research contexts.

Organizational issues
Application for this Seminar takes place exclusively via the WiWi portal during the specified timeframe. Please refrain from requests until the end of the application pahse.

There will be a kick-off and a final presentation.

Central criteria for evaluating your performance are the identification of relevant scientific sources, a systematization of literature, the highlighting of central findings, a clear, concise and intelligible presentation of results, and the identification of interesting research gaps.

- Di 4.11.2025, 15:45-17:15 -- Kick-off
- Di 10.02.2026, 9:00-12:15 – Abschlusspräsentationen
  Seminarraum Geb. 01.87 5B 25-26

V	2530586, WS 25/26, 2 SWS, Language: German, Open in study portal	Seminar (S) On-Site

Content
Within this seminar eLearning videos are produced to different topics out of the contents of our lectures. The student gets in touch with scientific work. Through profound working on a specific scientific topic the student is meant to learn the foundations of scientific research and reasoning in particular in finance.Through conduction of the video the student becomes familiar with the fundamental techniques for presentations and foundations of scientific reasoning. In addition, the student earns rhetorical skills.

The success is monitored by the development of an eLearning video and by the writing of a project report (according to §4(2), 3 SPO).

The overall grade is made up of these partial performances.

Recommendations:

Knowledge of the content of the modules *Essentials of Finance* [WW3BWLFBV1] (for bachelor students) and *F1 (Finance)* [WW4BWLFBV1] (for master students) is assumed.

The total workload for this course is approximately 90 hours. For further information see German version.

Organizational issues
Kickoff am 27.10.25 um 16 Uhr, Zwischenpräsentation am 09.12.25, 16 Uhr und Abschlusspräsentation am 27.01.26, 17:30 Uhr am Campus B (Geb. 09.21), Raum 209

V	**Bachelor Seminar (Information Systems III) – Sustainable Economies / More Human-like Conversational Agents** 2540471, WS 25/26, 2 SWS, Language: English, Open in study portal	Seminar (S) On-Site

Content
This seminar is offered by the Information Systems III research group, which has been based at the Institute for Information Systems (WIN) since January 2025 and is led by Prof. Dr. Jella Pfeiffer. Further information about us can be found on our website (WIN - Information Systems III).

V **Business Data Analytics** Seminar (S) On-Site
2540473, WS 25/26, 2 SWS, Language: German/English, Open in study portal

Content
wird auf deutsch und englisch gehalten

Organizational issues
Blockveranstaltung, siehe WWW

V **Bachelor Seminar in Data Science and Machine Learning** Seminar (S)
2540524, WS 25/26, 2 SWS, Language: German, Open in study portal

Literature
Weiterführende Literatur:

- W. Thomson. A Guide for the Young Economist. The MIT Press, 2001
- D.J. Brauner, H.-U. Vollmer. Erfolgreiches wissenschaftliches Arbeiten. Verlag Wissenschaft & Praxis, 2004
- University of Chicago Press. The Chicago Manual of Style. University of Chicago Press, 13th ed., 1982
- American Psychological Association. Concise of Rules of APA Style. American Psychological Association, 2005
- American Psychological Association. Publication Manual of the American Psychological Association. American Psychological Association, 2001

V **Seminar: Human Resources and Organizations (Bachelor)** Seminar (S) On-Site
2573010, WS 25/26, 2 SWS, Language: German, Open in study portal

Content
The topics are redefined each semester on basis of current research topics.The topics will be announced on the website of the Wiwi-Portal.

Aim

The student

- looks critically into current research topics in the fields of human resources and organizations.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Workload

The total workload for this course is: approximately 90 hours.

Lecture: 30h
Preparation of lecture: 45h
Exam preparation: 15h

Literature

Selected journal articles and books.

Organizational issues
Blockveranstaltung siehe Homepage

V **Seminar: Human Resource Management (Bachelor)** Seminar (S) On-Site
2573011, WS 25/26, 2 SWS, Language: German, Open in study portal

Content
The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

Aim

The student

- looks critically into current research topics in the fields of Human Resource Management and Personnel Economics.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Workload

The total workload for this course is: approximately 90 hours.

Lecture: 30h
Preparation of lecture: 45h
Exam preparation: 15h

Literature

Selected journal articles and books.

Organizational issues
Blockveranstaltung siehe Homepage

V **Seminar Management Accounting - Sustainability Topics**
2579919, WS 25/26, 2 SWS, Language: English, Open in study portal

Seminar (S)
On-Site

Content
The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in several meetings that are spread throughout the semester.

Learning objectives:

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources.

Examination:

- The performance review is carried out in the form of a "Prüfungsleistung anderer Art" (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade is made up of the grade of the seminar paper, the presentation and the contributions in the seminar sessions.

Required prior Courses:

- The course requires a basic knowledge of finance and accounting.

Workload:

- The total workload for this course is approximately 90 hours. For further information see German version.

Note:

- Maximum of 8 students.

Organizational issues
Ort und Zeit werden noch bekannt gegeben bzw. über ILIAS

Literature
Will be announced in the course.

V **Special Topics in Transportation Strategy**
2500061, SS 2026, 2 SWS, Language: English, Open in study portal

Seminar (S)
On-Site

Content
Course Content:

This course covers a range of important strategic questions across different transportation industries. Using suitable models from the areas of strategy and management, the participants will learn to evaluate structures, market forces and dynamics across different transportation industries and their impact on corporate strategy. On the basis of this, they will derive precise and well-founded recommendations for action.

This course offers students the opportunity to engage with current strategic issues and sharpen their skills in strategic analysis and evaluation. Through intensive collaboration and the practical application of the knowledge they have learned, students are optimally preparing for the requirements and challenges of modern corporate management.

The seminar is offered by the Chair of Management (Prof. Dr. Hagen Lindstädt) and will be held by Dr. Jürgen Müller. Dr. Müller worked at McKinsey & Company for 20 years, where he worked in different transportation and infrastructure industries (rail, road, sea, air) on an international level. Since 2015, he is Executive Vice President for Strategy and Rolling stock at the Danish State Railways.

Topics:

1. **Deregulation**: Deregulation in the European passenger air and rail markets has resulted in very different market outcomes. Describe, compare and evaluate the underlying structures, the process of deregulation and its outcomes in the two industries and develop recommendations for the future.
2. **Concentration:** Why is the combined global market share of the top 5 players in container shipping vs. logistics so different? Describe and evaluate the causes and most important implications from the past. How will the topic develop in the future?
3. **Modal share:** Why ist there such a big difference in modal share between rail freight in the US vs. rail freight in Europe? Describe and evaluate the causes and most important implications from the past. What development do you foresee for the European market?
4. **Cyclicaty:** Why is there such a high cyclicaty in the global container shipping market? Describe and evaluate the causes and most important implications from the past. How will the topic develop in the future?
5. **Vertical integration:** Large logistics companies have chosen different strategies with regards to vertical integration between container shipping and land-based logistics (e.g. Maersk /K&N vs. DB Schenker / DSV). Describe and evaluate the respective rationales and most important implications so far. How will the topic develop in the future?
6. **Profitability (I):** Why is average industry profitability of freight carriers so different across transport modes (road, rail, air and sea)? Assess the differences. Describe and evaluate the causes and most important implications from the past. How will the topic develop in the future?
7. **Pfrofitability (II):** "The quickest way to become a millionaire in the airline business is to start out as a billionaire" (Richard Branson). Analyze and discuss the truth of this statement and identify the underlying reasons. On this basis, derive recommendations for new entrants into the airline business.

Structure:

The course begins with an overarching introduction. Topics can be evaluated after the kickoff-meeting until 26.04.2026. Based on this, topics are assigned to groups of two. The main part of the course consists of writing and presenting a seminar paper - including a discussion of the results.

Target group: Bachelor students

Dates:

1. Kickoff: 24.04.2026,13:00 - 16:00 (remote via MS Teams)
2. Presentation Day 1: 22.06.2026, 14:00 - 18:00 (in person at IBU, building 05.20, room 2A-12.1)
3. Presentation Day 2: 23.06.2026, 09:00 - 12:00 (in person at IBU, building 05.20, room 2A-12.1)

Attendance is mandatory on all dates.

After completion of the course, the students are able to

- ... analyze complex industry structures and company situations, think strategically and derive well-founded recommendations.
- ... produce well-structured and convincing written papers that present the analysis and recommendations.
- ... present and discuss the results in an engaging and convincing manner and actively participate in discussions.

V **Human-Centered Systems Seminar: Engineering**
2500125, SS 2026, 3 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content

Formerly known as "Current Topics in Digital Transformation"

With this seminar, we aim to provide students with the possibility to independently work on state-of-the-art research topics in addition to the knowledge gained in the lectures of the human-centered systems lab (Prof. Mädche). Students will work on a dedicated topic in the context of human-centered systems and apply a pre-defined research method. A broad spectrum of topics is offered every semester, topics may range from creating an experimental design, analyzing collected data, or systematically comparing existing software prototypes in a specific field of interest.

V **Biosignal-Adaptive Systems Seminar**
2540553, SS 2026, 2 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content

Biosignal-adaptive systems collect and analyze biosignals from users to recognize user states as a basis for adaptation. Thermic, mechanical, electric, acoustic, and optical signals are collected using sensors which are integrated in wearables, e.g. glasses, earphones, belts, or bracelets. The collected data is processed with analytics and machine learning techniques in order to determine short-term, evolving over time, and long-term user states in the form of user characteristics, affective-cognitive states, or behavior. Finally, the recognized user states are leveraged for realizing user-centric adaptations.

In this seminar, interdisciplinary teams of students design, develop, and evaluate a biosignal-adaptive system prototype leveraging state-of-the-art hard- and software. This seminar follows an interdisciplinary approach. Students from the fields of computer science, information systems and industrial engineering & management collaborate in the prototype design, development, and evaluation.

The seminar is carried out in cooperation between Teco/Chair of Pervasive Computing Systems (Prof. Beigl) and the Institute of Information Systems and Marketing (h-lab, Prof. Mädche). It is offered as part of the DFG-funded graduate school “KD2School: Designing Adaptive Systems for Economic Decisions“ (https://kd2school.info/)

Learning objectives of the seminar

- Explain what a biosignal-adaptive system is and how it can be conceptualized
- Suggest and evaluate different design solutions for addressing the identified problem
- Build a biosignal-adaptive system prototype using state-of-the-art hard- and software
- Perform a user-centric evaluation of the biosignal-adaptive system prototype

Prerequisites

Strong analytical abilities and profound software development skills are required.

Organizational issues

Termine werden bekannt gegeben

Literature

Required literature will be made available in the seminar.

V **Human-Centered Systems Seminar: Research**
2540557, SS 2026, 3 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content
Formerly known as "Information Systems and Service Design Seminar"

With this seminar, we aim to provide students with the possibility to independently work on state-of-the-art research topics in addition to the knowledge gained in the lectures of the research group IS I (Prof. Mädche). The research group “Information Systems I” (IS I) headed by Prof. Mädche focuses in research, education, and innovation on designing interactive intelligent systems. It is positioned at the intersection of Information Systems and Human-Computer Interaction (HCI).

In the seminar, participants will get deeper insights in a contemporary research topic in the field of information systems, specifically interactive intelligent systems.

The actual seminar topics will be derived from current research activities of the research group. Our research assistants offer a rich set of topics from our research clusters (digital experience and participation, intelligent enterprise systems, or digital services design & innovation). Students can select among these topics individually depending on their personal interests. The seminar is carried out in the form of a literature-based thesis project. In the seminar, students will acquire the important methodological skills of running a systematic literature review.

Learning Objectives

- focus on a contemporary topic at the intersection of Information Systems and Human-Computer Interaction (HCI), specifically interactive intelligent systems
- carry out a structured literature search for a given topic
- aggregate the collected information in a suitable way to present and extract knowledge
- write a seminar thesis following academic writing standards
- deliver a presentation in a scientific context in front of an auditorium

Prerequisites

No specific prerequisites are required for the seminar.

Literature

Further literature will be made available in the seminar.

Organizational issues
Termine werden bekannt gegeben

V	**Seminar Human Resources and Organizations (Bachelor)** 2573010, SS 2026, 2 SWS, Language: German, Open in study portal	**Seminar (S)** **On-Site**

Content
The topics are redefined each semester on basis of current research topics.The topics will be announced on the website of the Wiwi-Portal.

Aim

The student

- looks critically into current research topics in the fields of human resources and organizations.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Workload

The total workload for this course is: approximately 90 hours.

Lecture: 30h
Preparation of lecture: 45h
Exam preparation: 15h

Literature

Selected journal articles and books.

Organizational issues
Geb. 05.20, Raum 2A-12.1, Termine werden bekannt gegeben

V

Seminar Human Resource Management (Bachelor)

2573011, SS 2026, 2 SWS, Language: German, Open in study portal

Seminar (S)
On-Site

Content

The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

Aim

The student

- looks critically into current research topics in the fields of Human Resource Management and Personnel Economics.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Workload

The total workload for this course is: approximately 90 hours.

Lecture: 30h
Preparation of lecture: 45h
Exam preparation: 15h

Literature

Selected journal articles and books.

Organizational issues

Geb. 05.20, Raum 2A-12.1, Termine werden bekannt gegeben

T 7.224 Module component: Seminar in Economics (Bachelor) [T-WIWI-103487]

Coordinators: Professorenschaft des Fachbereichs Volkswirtschaftslehre
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101816 - Seminar Module

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each term	1

Courses					
WT 25/26	2500052	Seminar on Topics in Digital Economics	2 SWS	Seminar /	Reiß, Hillenbrand, Potarca
WT 25/26	2500063	Economics of Crime	2 SWS	Seminar /	Mill
WT 25/26	2520561	Wirtschaftstheoretisches Seminar I (Bachelor)	2 SWS	Seminar /	Puppe, Ammann, Kretz, Okulicz
WT 25/26	2520562	Wirtschaftstheoretisches Seminar II (Bachelor)	2 SWS	Seminar /	Puppe, Ammann, Kretz
WT 25/26	2521310	Topics in Econometrics	2 SWS	Seminar	Schienle, Krüger, Bracher, Buse, Koster, Rüter, Leimenstoll, Renner, Pohle
WT 25/26	2560130	Seminar Public Finance	2 SWS	Seminar /	Wigger, Setio, Schmelzer
WT 25/26	2560140	Seminar in Digital Economics (Bachelor)	2 SWS	Seminar /	Rosar
WT 25/26	2560141	Seminar Game Theory and Behavioral Economics (Bachelor)	2 SWS	Seminar /	Rau
WT 25/26	2560400	Seminar in Macroeconomics I	2 SWS	Seminar /	Brumm, Pegorari, Kissling, Schang
WT 25/26	2561208	Selected aspects of European transport planning and -modelling	2 SWS	Seminar	Szimba, Sand
ST 2026	2500009	Seminar in Economic Theory IV	2 SWS	Seminar /	Ammann, Kretz, Okulicz
ST 2026	2500012	Making and Evaluating Predictions	2 SWS	Seminar	Schienle, Allen, Zhang
ST 2026	2500035	Efficiency analyses in network sectors	2 SWS	Seminar /	Mitusch, Latsch
ST 2026	2520535	Seminar in Economic Theory I	2 SWS	Seminar /	Ammann, Kretz, Okulicz
ST 2026	2560130	Seminar Public Finance	2 SWS	Block /	Wigger, Schmelzer
ST 2026	2560259	Organisation and Management of Development Projects	2 SWS	Seminar /	Sieber
ST 2026	2560400	Seminar in Macroeconomics I	2 SWS	Seminar /	Brumm, Frank
ST 2026	2560555	Seminar Lying and Cheating in Economic Decision Situations (Bachelor)	2 SWS	Seminar /	Rau

Exams			
WT 25/26	7900124	Seminar in Digital Economics (Bachelor)	Puppe
WT 25/26	7900139	Selected Aspects of European Transport Planning and Modelling	Mitusch
WT 25/26	7900141	Seminar in Economics (Bachelor)	Brumm
WT 25/26	7900155	Seminar: How to Make Democracy Work? Voting Methods in Theory and Practice (Bachelor)	Puppe
WT 25/26	7900212	Seminar in Economic Policy	Ott
WT 25/26	7900254	Topics in Econometrics	Schienle, Bracher
WT 25/26	7900278	Seminararbeit Game Theory and Behavioral Economics y (Bachelor)	Mill

WT 25/26	7900298	Seminar Economics of Crime (Bachelor)	Mill
WT 25/26	7900361	Seminar on Topics in Digital Economics	Reiß, Hillenbrand
WT 25/26	79sefi1	Seminar Public Finance (Bachelor)	Wigger
ST 2026	7900051	Seminar in Economic Policy	Ott
ST 2026	7900130	Lying and Cheating in Economic Decision Situations (Bachelor)	Rau
ST 2026	7900164	Seminar in Economics (Bachelor)	Mitusch

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Assessment
Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Additional Information
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: https://portal.wiwi.kit.edu.

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V **Economics of Crime** — Seminar (S) On-Site
2500063, WS 25/26, 2 SWS, Open in study portal

Content
For Bachelor students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Economathematics.

Organizational issues
Application is possible via https://portal.wiwi.kit.edu/Seminare

Kick-off: 29.10.2025, 11.00 - 12.30 h (Raum KD2Lab tbc)

Presentations: 16.01.2026 09.00 - 18.00 h, 01.85, KD2 Lab (1. floor über Außentreppe), Team Room

V **Topics in Econometrics** — Seminar (S)
2521310, WS 25/26, 2 SWS, Language: German, Open in study portal

Organizational issues
Wöchentliche Veranstaltung, Donnerstags 13:00-14:30 Uhr in B17 - R320

V **Seminar in Digital Economics (Bachelor)** — Seminar (S) On-Site
2560140, WS 25/26, 2 SWS, Language: English, Open in study portal

Content
The seminar addresses issues in the digital economy from a game-theoretic perspective. All information about the seminar will be published on the Wiwi-Portal.

V	**Seminar Game Theory and Behavioral Economics (Bachelor)** 2560141, WS 25/26, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **On-Site**

Content
For Bachelor students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Economathematics.

The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see https://polit.econ.kit.edu or https://portal.wiwi.kit.edu/Seminare

Seminar Papers of 8–10 pages are to be handed in.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

Organizational issues
Application is possible via https://portal.wiwi.kit.edu/Seminare

Kick-off: 29.10.2025, 14.00 - 15.30 h, Geb. 01.85, KD2Lab Team room (über Außentreppe)

Presentations: 19.01.2026, 08.00 - 13.00 h, Geb. 01.85, KD2Lab Team room (über Außentreppe)

V	**Making and Evaluating Predictions** 2500012, SS 2026, 2 SWS, Language: German/English, Open in study portal	**Seminar (S)**

Content
A key goal of statistics and data science is to make predictions. Good predictions are important for decision-making, allowing us to balance risks and mitigate the impacts of potentially damaging events. In this seminar, we will study theoretical questions regarding the evaluation of predictions, such as “What does it mean for a prediction to be good?”, before introducing statistical and machine learning methods to generate both point-valued and probabilistic predictions. We will discuss applications to economics, meteorology, and energy forecasting.

Format: The course will start with a short block course at the beginning of the lecture period. Evaluation will be based on a seminar thesis, which students are required to hand in at the end of the lecture period, and a short presentation. The presentations will also take place towards the end of the lecture period.

Organizational issues
Blockveranstaltung, Termine werden bekannt gegeben

V	**Seminar Public Finance** 2560130, SS 2026, 2 SWS, Language: German, Open in study portal	**Block (B)** **Blended (On-Site/Online)**

Content
See German version.

Organizational issues
Termine werden bekannt gegeben.

Literature
Literatur wird zu Beginn des jeweiligen Seminars vorgestellt.

V	**Seminar Lying and Cheating in Economic Decision Situations (Bachelor)** 2560555, SS 2026, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **On-Site**

Content
Objective of the Seminar: The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see http://polit.econ.kit.edu or https://portal.wiwi.kit.edu/Seminare

The acceptance of students for the seminar is based on preferences and suitability for the topics. This includes theoretical and practical experience with Behavioral Economics as well as English skills.

Seminar Papers of 12–15 pages are to be handed in.

Students' grades will be based on the quality of presentations in the seminar (40%) and the seminar paper (60%). There may be a bonus on the grade for actively participating in the discussions of the presentations.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

Organizational issues

Obligatory: Application via WiWi-Portal during the seminar registration period

Seminar Kick-off: 28.04.2026, 14.00 - 14.45 h

Seminar Presentations: 30.06.2026 9.30 - 18.00 h

Hand-in Seminar Papers: 02.08.2026

T 7.225 Module component: Seminar in Engineering Science Master (approval) [T-WIWI-108763]

Coordinators: Fachvertreter ingenieurwissenschaftlicher Fakultäten
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101816 - Seminar Module

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each term	3

Assessment
See German version.

Prerequisites
See module description.

Recommendations
None

T 7.226 Module component: Seminar in Informatics (Bachelor) [T-WIWI-103485]

Coordinators: Professorenschaft des Instituts AIFB
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101816 - Seminar Module

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each term	1

Courses					
WT 25/26	2513214	Seminar Information security and Data protection (Bachelor)	2 SWS	Seminar / 🗣	Volkamer, Raabe, Schiefer, Werner
WT 25/26	2513312	Seminar Linked Data and the Semantic Web (Bachelor)	3 SWS	Seminar / 🗣	Käfer, Braun, Li, Kubelka
WT 25/26	2513314	Seminar Real-World Challenges in Data Science and Analytics (Bachelor)	3 SWS	/ 🗣	Hoellig, Käfer, Thoma
WT 25/26	2513315	Seminar Real-World Challenges in Data Science and Analytics (Master)	3 SWS	/ 🗣	Hoellig, Käfer, Thoma
ST 2026	2513220	Seminar Intelligente Fahrzeugsysteme der nächsten Generation: Kognition, Personalisierung und adaptive Mobilität (Bachelor)	2 SWS	Seminar	Ullrich, Schreiber
ST 2026	2513308	Seminar Knowledge Discovery and Data Mining (Bachelor)	2 SWS	Seminar / 🗣	Käfer, Noullet, Kinder, Li
ST 2026	2513310	Seminar Data Science & Real-time Big Data Analytics (Bachelor)	2 SWS	Seminar / 🗣	Käfer, Thoma, Slobodyanik

Exams			
WT 25/26	7900038	Seminar Linked Data and the Semantic Web (Bachelor)	Färber
WT 25/26	7900187	Seminar Real-World Challenges in Data Science and Analytics (Bachelor)	Färber
WT 25/26	7900284	Seminar Information Security and Data Protection (Bachelor)	Oberweis
ST 2026	7900090	Seminar Data Science & Real-time Big Data Analytics (Bachelor)	Käfer
ST 2026	7900094	Seminar Knowledge Discovery and Data Mining (Bachelor)	Käfer
ST 2026	7900265	Biosignal-Adaptive Systems Seminar	Mädche

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Additional Information
Placeholder for seminars offered by the Institute AIFB. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: https://portal.wiwi.kit.edu.

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V **Seminar Linked Data and the Semantic Web (Bachelor)** — Seminar (S), On-Site
2513312, WS 25/26, 3 SWS, Language: German/English, Open in study portal

Content
Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this practical seminar is to build applications and devise algorithms that consume, provide, or analyse Linked Data.

The Linked Data principles are a set of practices for data publishing on the web. Linked Data builds on the web architecture and uses HTTP for data access, and RDF for describing data, thus aiming towards web-scale data integration. There is a vast amount of data available published according to those principles: recently, 4.5 billion facts have been counted with information about various domains, including music, movies, geography, natural sciences. Linked Data is also used to make web-pages machine-understandable, corresponding annotations are considered by the big search engine providers. On a smaller scale, devices on the Internet of Things can also be accessed using Linked Data which makes the unified processing of device data and data from the web easy.

In this practical seminar, students will build prototypical applications and devise algorithms that consume, provide, or analyse Linked Data. Those applications and algorithms can also extend existing applications ranging from databases to mobile apps.

For the seminar, programming skills or knowledge about web development tools/technologies are highly recommended. Basic knowledge of RDF and SPARQL are also recommended, but may be acquired during the seminar. Students will work in groups. Seminar meetings will take place as 'Block-Seminar'.

Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media

The exact dates and information for registration will be announced at the event page.

V **Seminar Real-World Challenges in Data Science and Analytics (Bachelor)** — On-Site
2513314, WS 25/26, 3 SWS, Language: German/English, Open in study portal

Content
In the seminar, various Real-World Challenges in Data Science and Analytics will be worked on.

During this seminar, groups of students work on a case challenge with data provided. Here, the typical process of a data science project is depicted: integration of data, analysis of these, modeling of the decisions and visualization of the results.

During the seminar, solution concepts are worked out, implemented as a software solution and presented in an intermediate and final presentation. The seminar "Real-World Challenges in Data Science and Analytics" is aimed at students in master's programs.

The exact dates and information for registration will be announced at the course page.

V **Seminar Real-World Challenges in Data Science and Analytics (Master)** — On-Site
2513315, WS 25/26, 3 SWS, Language: German/English, Open in study portal

Content
In the seminar, various Real-World Challenges in Data Science and Analytics will be worked on.

During this seminar, groups of students work on a case challenge with data provided. Here, the typical process of a data science project is depicted: integration of data, analysis of these, modeling of the decisions and visualization of the results.

During the seminar, solution concepts are worked out, implemented as a software solution and presented in an intermediate and final presentation. The seminar "Real-World Challenges in Data Science and Analytics" is aimed at students in master's programs.

The exact dates and information for registration will be announced at the course page.

V **Seminar Knowledge Discovery and Data Mining (Bachelor)**
2513308, SS 2026, 2 SWS, Language: English, Open in study portal

Seminar (S)
On-Site

Content
In this seminar different machine learning and data mining methods are implemented.

The seminar includes different methods of machine learning and data mining. Participants of the seminar should have basic knowledge of machine learning and programming skills.

Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market
- Scientific Publications

Further Information: https://aifb.kit.edu/web/Lehre/Praktikum_Knowledge_Discovery_and_Data_Science

The exact dates and information for registration will be announced at the event page.

Organizational issues
Die Anmeldung erfolgt über das WiWi-Portal https://portal.wiwi.kit.edu/ .

Literature
Detaillierte Referenzen werden zusammen mit den jeweiligenThemen angegeben. Allgemeine Hintergrundinformationen ergeben sich z.B.aus den folgenden Lehrbüchern:

- Mitchell, T.; Machine Learning
- McGraw Hill, Cook, D.J. and Holder, L.B. (Editors) Mining Graph Data, ISBN:0-471-73190-0
- Wiley, Manning, C. and Schütze, H.; Foundations of Statistical NLP, MIT Press, 1999.

V **Seminar Data Science & Real-time Big Data Analytics (Bachelor)**
2513310, SS 2026, 2 SWS, Language: English, Open in study portal

Seminar (S)
On-Site

Content
In this seminar, students will design applications in teams that use meaningful and creative Event Processing methods. Thereby, students have access to an existing record.

Event processing and real-time data are everywhere: financial market data, sensors, business intelligence, social media analytics, logistics. Many applications collect large volumes of data in real time and are increasingly faced with the challenge of being able to process them quickly and react promptly. The challenges of this real-time processing are currently also receiving a great deal of attention under the term "Big Data". The complex processing of real-time data requires both knowledge of methods for data analysis (data science) and their processing (real-time analytics). Seminar papers are offered on both of these areas as well as on interface topics, the input of own ideas is explicitly desired.

Further information to the seminar is given under the following Link:
http://seminar-cep.fzi.de

Questions are answered via the e-mail address sem-ep@fzi.de.

Organizational issues
Die Anmeldung erfolgt über das WiWi-Portal https://portal.wiwi.kit.edu/ .

7.227 Module component: Seminar in Mathematics (Bachelor) [T-MATH-102265]

Coordinators: Prof. Dr. Günter Last
Dr. Franz Nestmann
PD Dr. Steffen Winter

Organisation: KIT Department of Mathematics

Part of: M-WIWI-101816 - Seminar Module

Type	Credits	Grading	Version
Examination of another type	3 CP	graded	1

T 7.228 Module component: Seminar in Operations Research (Bachelor) [T-WIWI-103488]

Coordinators: Prof. Dr. Stefan Nickel
Prof. Dr. Steffen Rebennack
Prof. Dr. Oliver Stein

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-101816 - Seminar Module

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each term	1

Courses					
WT 25/26	2500056	Seminar: Modern OR and Innovative Logistics	2 SWS	Seminar / Blended	Nickel, Mitarbeiter, Pomes, Hoffmann
WT 25/26	2550131	Seminar on Methodical Foundations of Operations Research (B)	2 SWS	Seminar / On-Site	Stein, Beck, Schwarze, Neussel
WT 25/26	2550461	Seminar on Trending Topics in Optimization and Machine Learning (Bachelor)	2 SWS	Seminar / Blended	Rebennack, Kandora
WT 25/26	2550472	Seminar on Energy and Power Systems Optimization (Bachelor)	2 SWS	Seminar / Blended	Rebennack, Kandora
ST 2026	2550131	Seminar on Methodical Foundations of Operations Research (BA)	2 SWS	Seminar / On-Site	Stein, Beck, Schwarze, Neussel
ST 2026	2550132	Seminar on Mathematical Optimization (MA)	2 SWS	Seminar / On-Site	Stein, Beck, Schwarze, Neussel
Exams					
WT 25/26	7900011_WS2425	Seminar in Operations Research B (Bachelor)			Stein
WT 25/26	7900012_WS2425	Seminar in Operations Research A (Master)			Stein
WT 25/26	7900040	Seminar: Modern OR and Innovative Logistics			Nickel
WT 25/26	7900113	Seminar Trending Topics in Optimization and Machine Learning (Bachelor)			Rebennack
WT 25/26	7900194	Digitalization in the Steel Industry			Nickel
WT 25/26	7900313	Seminar on Power Systems Optimization (Bachelor)			Rebennack
ST 2026	7900200_SS2025	Seminar in Operations Research A (Master)			Stein
ST 2026	7900201_SS2025	Seminar in Operations Research (Bachelor)			Stein

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Additional Information
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: https://portal.wiwi.kit.edu.

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V	**Seminar: Modern OR and Innovative Logistics** 2500056, WS 25/26, 2 SWS, Language: German, Open in study portal	**Seminar (S)** **Blended (On-Site/Online)**

Content
This seminar presents current issues in the field of Operations Research and Logistics, critically evaluates them, and discusses them using examples. The focus of the seminar lies on optimization models and algorithms, with particular attention to their practical applicability (especially in supply chain and health care management). All participants are required to write a seminar paper and give a presentation. Depending on the topic, an implementation of the models or heuristics using standard software (e.g., IBM CPLEX or Java) is expected. Further details can be found in the information sheet on Prof. Nickel's website. All topics have the potential to be developed into a thesis.

The seminar topics will be assigned during a preliminary meeting at the beginning of the semester. Attendance is mandatory for the preliminary meeting as well as for all seminar presentations.

In addition, students will receive an introduction to academic writing, literature research, and scientific presenting in three sessions.

Organizational issues
Die Anmeldung erfolgt über das Wiwi-Portal. Nähere Informationen erhalten Sie auf der Homepage dol.ior.kit.edu bzw. im WiWi-Portal sowie bei der Vorbesprechung.

Literature
Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.

V	**Seminar on Methodical Foundations of Operations Research (B)** 2550131, WS 25/26, 2 SWS, Language: German, Open in study portal	**Seminar (S)** **On-Site**

Content
The seminar aims at describing, evaluating, and discussing recent as well as classical topics in continuous optimization. The focus is on the treatment of optimization models and algorithms, also with respect to their practical application.

Bachelor studenst are introduced to the style of scientific work. By focussed treatment of a scientific topic they deal with the basics of scientific investigation and reasoning.

For further development of a scientific work style, master students are particularly expected to critically question the seminar topics.

With regard to the oral presentations the students become acquainted with presentation techniques and basics of scientifc reasoning. Also rethoric abilities may be improved.

Remarks:

Attendance at all oral presentations is compulsory.

Preferably at least one module offered by the Institute of Operations Research should have been chosen before attending this seminar.

Assessment:

The assessment is composed of a 15-20 page paper as well as a 40-60 minute oral presentation according to §4(2), 3 of the examination regulation.The grade is composed of the equally weighted assessments of the paper and the oral presentation.

The seminar is appropriate for bachelor as well as for master students. Their differentiation results from different assessment criteria for the seminar paper and the oral presentation.

Workload:

The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Die Literaur und die relevanten Quellen werden gegen Ende des vorausgehenden Semesters im Wiwi-Portal und in einer Seminarvorbesprechung bekannt gegeben.

References and relevant sources are announced at the end of the preceding semester in the Wiwi-Portal and in a prepatory meeting.

V **Seminar on Methodical Foundations of Operations Research (BA)**
2550131, SS 2026, 2 SWS, Language: German, Open in study portal

Seminar (S)
On-Site

Content
The seminar aims at describing, evaluating, and discussing recent as well as classical topics in continuous optimization. The focus is on the treatment of optimization models and algorithms, also with respect to their practical application.

Bachelor studenst are introduced to the style of scientific work. By focussed treatment of a scientific topic they deal with the basics of scientific investigation and reasoning.

For further development of a scientific work style, master students are particularly expected to critically question the seminar topics.

With regard to the oral presentations the students become acquainted with presentation techniques and basics of scientifc reasoning. Also rethoric abilities may be improved.

Remarks:

Attendance at all oral presentations is compulsory.

Preferably at least one module offered by the Institute of Operations Research should have been chosen before attending this seminar.

Assessment:

The assessment is composed of a 15-20 page paper as well as a 40-60 minute oral presentation according to §4(2), 3 of the examination regulation.The grade is composed of the equally weighted assessments of the paper and the oral presentation.

The seminar is appropriate for bachelor as well as for master students. Their differentiation results from different assessment criteria for the seminar paper and the oral presentation.

Workload:

The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Die Literaur und die relevanten Quellen werden gegen Ende des vorausgehenden Semesters im Wiwi-Portal und in einer Seminarvorbesprechung bekannt gegeben.

References and relevant sources are announced at the end of the preceding semester in the Wiwi-Portal and in a prepatory meeting.

T 7.229 Module component: Seminar in Statistics (Bachelor) [T-WIWI-103489]

Coordinators: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101816 - Seminar Module

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each term	1

Courses					
WT 25/26	25000111	Statistics and Epidemics	2 SWS	Seminar / 🗣	Bracher, Nemcova
WT 25/26	2500018		2 SWS	Seminar / 🗣	Grothe, Liu
WT 25/26	2521310	Topics in Econometrics	2 SWS	Seminar	Schienle, Krüger, Bracher, Buse, Koster, Rüter, Leimenstoll, Renner, Pohle
ST 2026	2500012	Making and Evaluating Predictions	2 SWS	Seminar	Schienle, Allen, Zhang
ST 2026	2521310	Advanced Topics in Econometrics	2 SWS	Seminar	Schienle, Krüger, Bracher, Buse, Koster, Rüter, Leimenstoll, Renner
ST 2026	2550560	Spezielle Themen zu Statistik, Datenanalyse und maschinellem Lernen	2 SWS	Seminar / 🗣	Grothe, Liu
Exams					
WT 25/26	7900254	Topics in Econometrics			Schienle, Bracher
WT 25/26	7900299	Seminar in Statistics (Bachelor)			Grothe

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Additional Information
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: https://portal.wiwi.kit.edu.

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V	**Statistics and Epidemics** 25000111, WS 25/26, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **On-Site**

Content
Motivation
Infectious disease epidemiology gives rise to a large variety of real-time data streams. During the COVID-19 pandemic, the interpretation and statistical analysis of these data has proven crucial, but also highly challenging. In this seminar, students will get to know central concepts of infectious disease surveillance and modelling from a statistical perspective. Following an overview of various aspects in the form of blocked lectures, students will choose a more specific topic for their seminar thesis.

Learning Goals

Students develop an understanding of central modeling tasks and methods, including

- estimation of reproductive numbers
- compartment models of disease spread
- nowcasting and short-term forecasting of disease spread
- detection of outbreaks
- diagnostic testing

Moreover, they get to know various data types commonly used in the analysis of disease spread.

Logistics

The project seminar is worth 4.5 credit points (Leistungspunkte). There will be three blocked lectures (approx. 135 minutes each) in the beginning of the lecture period. For the various topics covered, subjects for seminar theses will be proposed (and students are allowed to propose their own topics). Towards the end of the semester, students present their progress on the chosen topics to the group. Grades will be based on this presentation (25%) and the final report (75%).

Organizational issues
Prerequisites

Students should have a very good working knowledge of statistics, including proficiency in a programming language for applied data analysis. The lecture VWL3 Introduction to Econometrics is a prerequisite for the project seminar. Most available software in the field is in R, but in principle Python can be used as well. Advanced knowledge of biology, medicine or epidemiology is not required.

Application Procedure
Please submit a transcript of records as well as a short letter of motivation (roughly 200 words) via WIWI-Portal: https://portal.wiwi.kit.edu/ys/8902

Application time frame: September 5th, 2025 to October, 31th, 2025.

V	**Topics in Econometrics** 2521310, WS 25/26, 2 SWS, Language: German, Open in study portal	**Seminar (S)**

Organizational issues
Wöchentliche Veranstaltung, Donnerstags 13:00-14:30 Uhr in B17 - R320

V	**Making and Evaluating Predictions** 2500012, SS 2026, 2 SWS, Language: German/English, Open in study portal	**Seminar (S)**

Content
A key goal of statistics and data science is to make predictions. Good predictions are important for decision-making, allowing us to balance risks and mitigate the impacts of potentially damaging events. In this seminar, we will study theoretical questions regarding the evaluation of predictions, such as "What does it mean for a prediction to be good?", before introducing statistical and machine learning methods to generate both point-valued and probabilistic predictions. We will discuss applications to economics, meteorology, and energy forecasting.

Format: The course will start with a short block course at the beginning of the lecture period. Evaluation will be based on a seminar thesis, which students are required to hand in at the end of the lecture period, and a short presentation. The presentations will also take place towards the end of the lecture period.

Organizational issues
Blockveranstaltung, Termine werden bekannt gegeben

V **Advanced Topics in Econometrics**
2521310, SS 2026, 2 SWS, Language: German/English, Open in study portal

Seminar (S)

Organizational issues
wöchentlich, Donnerstags 11:00-12:30, B17, R320

T 7.230 Module component: Seminar Production Technology [T-MACH-109062]

Coordinators: Prof. Dr.-Ing. Jürgen Fleischer
Prof. Dr.-Ing. Gisela Lanza
Prof. Dr.-Ing. Volker Schulze

Organisation: KIT Department of Mechanical Engineering

Part of: M-WIWI-101816 - Seminar Module

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each term	1

Courses					
ST 2026	2149665	Seminar Production Technology	1 SWS	Seminar / 🗣	Fleischer, Lanza, Schulze, Zanger
Exams					
WT 25/26	76-T-MACH-109062	Seminar Production Technology			Fleischer, Lanza, Schulze, Zanger

Legend: 📱 Online, ❖ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Alternative test achievement (graded):

- written elaboration (workload of at least 80 h)
- oral presentation (approx. 30 min)

Prerequisites
none

Additional Information
The course is offered in German.

The specific topics are published on the homepage of the wbk Institute of Production Science.

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V Seminar Production Technology

Seminar (S)
On-Site

2149665, SS 2026, 1 SWS, Language: German, Open in study portal

Content

In course of the seminar Production Technology current issues of the wbk main fields of research "Manufacturing and Materials Technology", "Machines, Equipment and Process Automation" as well as "Production Systems" are discussed.

The specific topics are published on the homepage of the wbk Institute of Production Science.

Learning Outcomes:

The students ...

- are in a position to independently handle current, research-based tasks according to scientific criteria.
- are able to research, analyze, abstract and critically review the information.
- can draw own conclusions using their interdisciplinary knowledge from the less structured information and selectively develop current research results.
- can logically and systematically present the obtained results both orally and in written form in accordance with scientific guidelines (structuring, technical terminology, referencing). They can argue and defend the results professionally in the discussion.

Workload:

regular attendance: 10 hours
self-study: 80 hours

Organizational issues

siehe http://www.wbk.kit.edu/seminare.php

T 7.231 Module component: Seminar: Legal Studies Bachelor [T-INFO-115024]

Coordinators: Professorenschaft des Fachbereichs Recht
Organisation: KIT Department of Informatics
Part of: M-WIWI-101816 - Seminar Module

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each term	1

Courses					
WT 25/26	2400014	Current Issues in Patent Law	2 SWS	Seminar / On-Site	Melullis
WT 25/26	2400165	Seminar Commercial and Corporate Law in Information Technology	2 SWS	Seminar / Online	Nolte
WT 25/26	2400177	Human vs. Machine: (Un-)Biased Legal Decision-Making?	2 SWS	Seminar / On-Site	Holzhausen
WT 25/26	2400184	EU Digital Regulatory Framework	2 SWS	Seminar / On-Site	Zufall
WT 25/26	2400203	EU Fundamental Rights and EU Economic Law in Smart Cities	2 SWS	Seminar / On-Site	Kasper-Schöniger
WT 25/26	2424186	Seminar Patent Law	2 SWS	Seminar / On-Site	Dammler
WT 25/26	2424389	Seminar "IT security law"	2 SWS	Seminar / On-Site	Schallbruch
WT 25/26	2513214	Seminar Information security and Data protection (Bachelor)	2 SWS	Seminar / On-Site	Volkamer, Raabe, Schiefer, Werner
ST 2026	2400005	Governance, Risk & Compliance	2 SWS	Seminar / On-Site	Herzig, Siddiq
ST 2026	2400078	Intelligente Chatbots und Recht	2 SWS	Seminar / On-Site	Raabe
ST 2026	2400171	Regulating AI: from ethics to law	2 SWS	Seminar / On-Site	Gil Gasiola
ST 2026	2400177	Designing Data Governance of Digital Systems	2 SWS	Seminar / On-Site	Pathak
ST 2026	2400225	Rechtlicher Rahmen für Künstliche Intelligenz	2 SWS	Seminar / On-Site	Sattler
ST 2026	24820	Current Issues in Patent Law	2 SWS	Seminar / On-Site	Melullis
Exams					
WT 25/26	7500249	Seminar: IT- Security Law			Zufall
WT 25/26	7500298	Seminar: Law and Legal Studies			Zufall
WT 25/26	7500310	Seminar: Commercial and Corporate Law in the IT Industry			Matz
ST 2026	7500268	Seminar aus Rechtswissenschaften Bachelor und Master I (LS Zivilrecht u. LS Prof. F. Boehm)			Boehm, Melullis, Raabe, Sattler
ST 2026	7500341	Seminar: Legal Studies Bachelor and Master I (LS Öffentliches Recht und Informatik)			Zufall

Legend: Online, Blended (On-Site/Online), On-Site, x Cancelled

Below you will find excerpts from courses related to this module component:

V Human vs. Machine: (Un-)Biased Legal Decision-Making?

Seminar (S)
On-Site

2400177, WS 25/26, 2 SWS, Language: English, Open in study portal

Content

This seminar provides an overview of the foundational principles of behavioral economics and their relevance to public law. Special attention is given to (biased) decision-making, both from a substantive and procedural perspective. Students will explore how regulation should be designed to account for cognitive biases and achieve intended policy outcomes. In addition, the seminar will address the role of automated decision-making systems - examining how such systems are influenced by, and may also reinforce or mitigate, behavioral biases.

The seminar will cover the following topics:

- Introduction to (behavioral) economic theory and its application to law
- Cognitive biases and their impact on (public) decision-making
- Different types of regulation in light of behavioral insights
- Implications for automated decision-making systems
- The role of human biases in the AI Act

Algorithmic decision-making is often treated as a black box—something that should not be permitted to make decisions in legal contexts. In response, Article 14 of the EU AI Act requires high-risk AI systems to be designed in such a way that they can be effectively overseen by natural persons. This human-in-the-loop requirement stems, among other things, from the perception that AI systems operate ambiguously and produce decisions that are not fully comprehensible.

However, treating humans in comparison as fundamentally transparent or fully rational decision-makers is equally naïve. Understanding how people actually behave—not just how they should behave—is essential for designing effective, fair, and legitimate legal systems. Traditional legal research often assumes rational actors, yet behavioral research shows that cognitive biases, heuristics, and emotional influences shape the decisions of both citizens and public officials.

This seminar addresses that gap by equipping students with behavioral insights to critically assess and improve legal and administrative. A particular focus is placed on how human biases are already embedded in the data underlying automated decision-making systems, potentially reproducing or amplifying unfairness. At the same time, students will explore how such systems can be intentionally designed to mitigate behavioral distortions and support better decision-making.

Organizational issues

1. Termin: 13.11.2025 9:00-15:00 Uhr (Seminarrum Nr. 313, bei uns am Institut)

2. Termin: 05.02.2025 9:00- 16:00 Uhr (Seminarrum Nr. 313, bei uns am Institut).

V	**EU Digital Regulatory Framework** 2400184, WS 25/26, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **On-Site**

Content

This class aims to provide an overview on the legal instruments forming the EU digital regulatory framework. Following its Digital Single Market Strategy, the EU has set up a new strategic programme for a "Digital Decade". Existing regulations like the General Data Protection Regulation (GDPR), or the E-Commerce Directive, are being complemented by a variety of new instruments that aim to set binding rules on online markets, to regulate data flows in various ways, but also to pioneer a legal framework on AI. Prominent instruments include the new AI Act, the Digital Services Act (DSA) and Digital Markets Act (DMA), the Data Act, Data Governance Act, or Open Data Directive.

The class will provide an overview on the existing framework: Which regulations and directives are relevant? How do they apply and interact which each other in a broader context?

Another objective is to provide students with the ability to read these legal instruments: How to access regulatory instruments that often have more than 100 pages (without having to read every single sentence)? How to gain a comprehensive, high-level understanding of the instrument? How to identify parts relevant to a particular legal problem?

The class will start with an introduction into EU law and regulatory instruments in general. Concrete guidance on reading, analysing and working with legal instruments in English will be given. Based on these instructions, students will be assigned legal instruments to present in the final unit along with a two-pages report.

Grades will be assigned based on the quality of these presentations and the report, as well as participation in the discussion (presentation: 40 %, two-pages report: 40 %, discussion: 20 %).

Organizational issues

WS 2024/25

Hierbei handelt es sich NICHT um eine Pro-Seminar, sondern um ein Seminar (aus Rechtswissenschaften).

Anmeldungen für das Seminar bitte NUR! über das WiWi-Portal!

***Für die Prüfung bitte NUR über CAS (Campus-Portal) anmelden!**

*Erläuterung: nach der für die Teilnahme am Seminar verbindlichen Teilnahme an der Einführungsveranstaltung bitte Anmeldung über das Campus-System (notwendig für die Erfassung der Note der Seminararbeit).

V	**EU Fundamental Rights and EU Economic Law in Smart Cities** 2400203, WS 25/26, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **On-Site**

Content
This seminar is designed to instruct students in recognising legal questions as they relate to an interdisciplinary topic, classifying such questions along the hierarchy of norms, and solving them in a convincing argumentative manner. By focusing on „EU Fundamental Rights and EU Economic Law in Smart Cities“, we will discuss the influence of large cities and metropolises on their more rural periphery. Possible aspects of discussion are, inter alia,

- democratic legitimacy questions in such cases,
- elements of structural support/aid
- approaches to implement technical innovations in smart cities,
- questions relating to the development of (large) infrastructures,
- aspects of the efficient use of infrastructure, and
- environmental aspects.

Particularly in times of increasingly comprehensive European regulation, European standards and regulatory approaches will be at the heart of the discussion while not neglecting their interplay with national regulation. Learning in more depth about the interplay of European and national regulation will further accustom participating students to discuss relevant legal questions across (legal) sectors and with a broader view on regulations' effects.

Conducting the seminar in English intends to facilitate students to link their ideas and arguments to current European and international debates.

Organizational issues
This is a seminar (not a pro-seminar).

Registrations only via Wiwi-Portal.

Kick-off-meeting WS 2025/26:

Friday, 7th November 2025, 14:00 - 18:00 h (online)

(Mr. Kasper-Schöniger will send you the according link via ILIAS a few days before the kick-off date.)

Presentations:

- Friday, 6th February 2026, 09:00 - 18:00 h

and

- Saturday, 7th February 2026, 10:00 - 16:00

Place: see section "TERMINE" (below).

V **Regulating AI: from ethics to law**
2400171, SS 2026, 2 SWS, Language: English, Open in study portal

Seminar (S)
On-Site

Content
This seminar will provide an overview of technology regulation, with a particular focus on the regulation of AI systems. Following an introduction to the different forms of regulation, students will explore the various regulatory instruments in light of the key principles of AI, such as

- fairness / non-discrimination,
- transparency / explainability,
- non-maleficence,
- privacy / data protection,
- sustentability
- security / safety, and
- accountability.

This will enable them to discuss how these principles and rules can be applied in real-world scenarios.

Organizational issues
Please register for the seminar ONLY via the WiWi-Portal!
Please register for the exam ONLY via CAS (Campus-Portal)!*

*ExplanationAfter attending the introductory event, which is mandatory for participation in the seminar, please register via the campus system (necessary for recording the grade of the seminar paper).

Block Seminar in Summer term 2026:

- **Wednesday, 22th April 2026, 09:00 - 13:00 h;**
- **Wednesday, 22th July 2026, 09:00 - 13:00 h.**

Room: each seminar takes place in room no. 313 (building 07.08) .

V

Designing Data Governance of Digital Systems
2400177, SS 2026, 2 SWS, Language: English, Open in study portal

Seminar (S)
On-Site

Content
The latest regulations in the digital sector at EU level represent a highly topical and important regulatory instrument with enormous practical relevance for students of computer science and business informatics. The seminar not only enables students to acquire important knowledge in this area, but also to apply it specifically to the governance of digital systems and to learn the practical design of digital systems against the background of legal framework conditions.

Organizational issues
***Please register <u>for the exam ONLY via CAS</u> (Campus-Portal)**!

***Explanation:<u>after</u> attending the introductory event,** which is mandatory for participation in the seminar**, please register via the campus system** (necessary for recording the grade of the seminar paper).

Due to the minimum number of text characters that can be used, please check ILIAS and the WiWi portal for details such as dates and location. Thank you.

T 7.232 Module component: Signals and Systems [T-ETIT-112860]

Coordinators: Dr.-Ing. Mathias Kluwe
Prof. Dr.-Ing. Sander Wahls

Organisation: KIT Department of Electrical Engineering and Information Technology

Part of: M-ETIT-106372 - Signals and Systems

Type	Credits	Grading	Term offered	Expansion	Version
Written examination	7 CP	graded	Each winter term	1 semesters	1

Courses					
WT 25/26	2302109	Signals and Systems	3 SWS	Lecture / 🗣	Wahls, Kluwe
WT 25/26	2302111	Signals and Systems (Tutorial to 2302109)	2 SWS	Practice / 🗣	Wahls, Illerhaus, Gardi
Exams					
WT 25/26	7302109	Signals and Systems			Wahls, Kluwe

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment of success takes place in the form of a written examination lasting 180 minutes. The module grade is the grade of the written examination.

Prerequisites
none

Recommendations
Knowledge of higher mathematics (e.g. M-MATH-101731, M-MATH-101732 and M-MATH-101738) is required. Fundamentals of electrical circuits and networks (e.g. M-ETIT-106417 - Lineare Elektrische Netze) are helpful.

T 7.233 Module component: Signals and Systems - Workshop [T-ETIT-112861]

Coordinators: Prof. Dr.-Ing. Sander Wahls
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-106372 - Signals and Systems

Type	Credits	Grading	Term offered	Expansion	Version
Coursework	2 CP	pass/fail	Each summer term	1 semesters	2

Courses					
ST 2026	2302905	Signals and Systems - Workshop	1 SWS	Practical course / Blended	Wahls, Jin
Exams					
ST 2026	7302314	Signals and Systems - Workshop			Wahls

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Prerequisites
none

T 7.234 Module component: SIL-LaunchLab [T-WIWI-114635]

Coordinators: Prof. Dr. Orestis Terzidis
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-107451 - Entrepreneurial Thinking and Action: Fundamentals of Entrepreneurship

Type	Credits	Grading	Term offered	Version
Examination of another type	9 CP	graded	Each summer term	1

Courses					
ST 2026	2545022	SIL - LaunchLab	6 SWS	Seminar / 🗣	Böhrer, Terzidis
Exams					
ST 2026	7900331	SIL-LaunchLab			Terzidis

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment is conducted as an alternative exam assessment. The specific form of assessment depends on the course and may include, for example, the following components:

- **Project Report or Reflection Paper**
- **Mid-term and Final Presentation**
- **Group Work with Individual Contribution**
- **Active Participation and Mandatory Attendance**

The overall grade is determined by the weighted evaluation of these individual assessment components. The detailed weighting of these components for grade calculation will be communicated to students at the beginning of the course.

Prerequisites
None

Recommendations
An interest in entrepreneurial thinking and action, teamwork, and interdisciplinary project work is recommended. Basic knowledge in business administration and/or innovation methods is helpful but not required.

Workload
270 hours

Below you will find excerpts from courses related to this module component:

V SIL - LaunchLab
2545022, SS 2026, 6 SWS, Open in study portal

Seminar (S)
On-Site

Content

Course content:

In the SIL LaunchLab, you will work in interdisciplinary teams on real innovation projects from the Student Innovation Lab (SIL) at KIT. As part of the seminar, you will take on the role of a project mentor and support an existing SIL team in further developing its start-up idea. This can include tasks such as market analysis, business model development, or pitch preparation, and will be defined individually at the start of the seminar. Through this, you gain direct insights into technology-based start-up projects at KIT and apply entrepreneurial methods to real start-up cases.

Learning Objectives:
After completing the course, participants will be able to:

- Analyze and support real start-up projects in a structured way
- Conduct market and user analyses
- Evaluate and further develop a business model using the Business Model Canvas tool
- Assist teams in preparing for investor and customer pitches
- Develop a basic understanding of technology-driven spin-offs

Seminar Information:
Participation is only possible during the summer semester. The seminar is aimed at bachelor students from the 4th semester onwards from all disciplines. Places are limited. Registration takes place via the WiWi portal and, after admission, via CAS for the corresponding examination.

T 7.235 Module component: Simulation with Lumped Parameters [T-MACH-113862]

Coordinators: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-101265 - Vehicle Development
M-MACH-101267 - Mobile Machines

Type	Credits	Grading	Term offered	Expansion	Version
Oral examination	3 CP	graded	Each summer term	1 semesters	3

Courses					
ST 2026	2114071	Simulation with Lumped Parameters	2 SWS	Lecture / 🗣	Geimer
Exams					
WT 25/26	76-T-MACH-111822	Simulation with Lumped Parameters			Geimer

Legend: 🖥 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral examination, duration approx. 20 minutes

Prerequisites
none

Recommendations
Knowledge of mechanics and hydraulics

Qualification goals

After completing this part of the course, students will be able to evaluate how a simulation with concentrated parameters can be used sensibly and which simulation methods are suitable for a given problem. They will be able to create a model for a given problem and explain and implement algorithms for solving a model. You will acquire in-depth knowledge of how a system can be modelled and parameterized with concentrated parameters. You will be able to carry out simulation studies, evaluate simulation results and recognize and avoid errors in the simulation.

Contents:

The basics of discrete-time modeling are taught using the example of simulation with concentrated parameters. For this purpose, modeling in the disciplines of mechanics, electrics and hydraulics is shown by way of example and analogies are drawn. Furthermore, possibilities for simulation coupling of the discipline are shown. The students solve exemplary tasks with the help of simulation and briefly summarize the solutions in a report.

Recommended are:

Basic knowledge of Matlab/Simulink and hydraulics.

Knowledge of the dynamics of mechanical systems and the fundamentals of electrical engineering is assumed.

Additional Information
The course is offered in German.

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V Simulation with Lumped Parameters

2114071, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

Learning objectives (qualification objectives):

After completing this part of the course, students will be able to evaluate how a simulation with concentrated parameters can be used sensibly and which simulation methods are suitable for a given problem. They can create a model for a problem and can explain and implement algorithms for solving a model. You will acquire in-depth knowledge of how a system can be modelled and parameterized with concentrated parameters. You will be able to carry out simulation studies, evaluate simulation results and recognize and avoid errors in the simulation.

Contents:

The basics of discrete-time modeling are taught using the example of simulation with concentrated parameters. For this purpose, modeling in the disciplines of mechanics, electrics and hydraulics is shown by way of example and analogies are drawn. Furthermore, possibilities for simulation coupling of the disciplines are shown. The students solve exemplary tasks with the help of simulation and briefly summarize the solutions in a report.

Recommended are:

Basic knowledge of Matlab/Simulink and hydraulics.

Knowledge of the dynamics of mechanical systems and the fundamentals of electrical engineering is assumed.

T 7.236 Module component: Social Science A (WiWi) [T-GEISTSOZ-109048]

Coordinators: Prof. Dr. Gerd Nollmann
Organisation: KIT Department of Humanities and Social Sciences
Part of: M-GEISTSOZ-101167 - Sociology/Empirical Social Research

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each winter term	1

Courses					
WT 25/26	5011011	Artificial intelligence in the research process	2 SWS	Seminar / Blended	Banisch
WT 25/26	5011014	Advanced module:Technology and Future: Theories of prospective knowledge	2 SWS	Seminar / On-Site	Lösch
ST 2026	5000048	Socio-scientific Theories of Technology Assessment	2 SWS	Proseminar / On-Site	Lösch
ST 2026	5011013	Digital democracy: worries, opportunities, and challenges	2 SWS	Seminar / Blended	Mäs
ST 2026	5011019	How to control algorithms?	2 SWS	Seminar / On-Site	Mäs
Exams					
WT 25/26	7400041	Social Science A (WiWi)			Nollmann, Lösch

Legend: Online, Blended (On-Site/Online), On-Site, × Cancelled

Below you will find excerpts from courses related to this module component:

V Artificial intelligence in the research process

5011011, WS 25/26, 2 SWS, Language: German, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content

ChatGPT und andere Large Language Models (LLMs) transformieren unsere Gesellschaft auf vielen Ebenen. Auch Studium und Wissenschaft stehen vor tiefgreifenden Veränderungen. Im Seminar „Künstliche Intelligenz im Forschungsprozess" nähern wir uns diesen neuen Technologien und erproben, wie sie sinnvoll eingesetzt werden können, um aktuelle Forschungsfragen zu adressieren. Wir orientieren uns dabei an den Methoden und Fragestellungen der Computer-gestützen Sozialwissenschaft (Computational Social Science) mit besonderem Fokus auf die Extraktion komplexer Bedeutungsmuster (z.B. Meinungen, Argumente, Narrative, etc.). Das Seminar ist als Blockseminar mit zwei Blöcken konzipiert (voraussichtlich Januar and März). Gemeinsam erarbeiten wir Themen für Miniprojekte, die zwischen den beiden Blöcken von den Studierenden bearbeitet werden. Im Vorfeld wird es eine online-Sitzung geben.

Organizational issues

Diese Veranstaltung wird als Blockseminar angeboten.

NEUE TERMINE:

Di: 03.03.2026 09.00 - 17.00

Mi: 18.03.2026 09.00 - 17.00

DO: 19.03.2026 09.00 - 17.00

T 7.237 Module component: Social Science B (WiWi) [T-GEISTSOZ-109049]

Coordinators: Prof. Dr. Gerd Nollmann
Organisation: KIT Department of Humanities and Social Sciences
Part of: M-GEISTSOZ-101167 - Sociology/Empirical Social Research

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each winter term	1

Courses					
WT 25/26	5011011	Artificial intelligence in the research process	2 SWS	Seminar / Blended	Banisch
WT 25/26	5011014	Advanced module:Technology and Future: Theories of prospective knowledge	2 SWS	Seminar / On-Site	Lösch
ST 2026	5000048	Socio-scientific Theories of Technology Assessment	2 SWS	Proseminar / On-Site	Lösch
Exams					
WT 25/26	7400046	Social Science B (WiWi)			Nollmann, Lösch

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Below you will find excerpts from courses related to this module component:

V Artificial intelligence in the research process

5011011, WS 25/26, 2 SWS, Language: German, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content

ChatGPT und andere Large Language Models (LLMs) transformieren unsere Gesellschaft auf vielen Ebenen. Auch Studium und Wissenschaft stehen vor tiefgreifenden Veränderungen. Im Seminar „Künstliche Intelligenz im Forschungsprozess“ nähern wir uns diesen neuen Technologien und erproben, wie sie sinnvoll eingesetzt werden können, um aktuelle Forschungsfragen zu adressieren. Wir orientieren uns dabei an den Methoden und Fragestellungen der Computer-gestützten Sozialwissenschaft (Computational Social Science) mit besonderem Fokus auf die Extraktion komplexer Bedeutungsmuster (z.B. Meinungen, Argumente, Narrative, etc.). Das Seminar ist als Blockseminar mit zwei Blöcken konzipiert (voraussichtlich Januar and März). Gemeinsam erarbeiten wir Themen für Miniprojekte, die zwischen den beiden Blöcken von den Studierenden bearbeitet werden. Im Vorfeld wird es eine online-Sitzung geben.

Organizational issues

Diese Veranstaltung wird als Blockseminar angeboten.

NEUE TERMINE:

Di: 03.03.2026 09.00 - 17.00

Mi: 18.03.2026 09.00 - 17.00

DO: 19.03.2026 09.00 - 17.00

T 7.238 Module component: Special Topics in Information Systems [T-WIWI-109940]

Coordinators: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101434 - eBusiness and Service Management

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each term	2

Assessment
The assessment of this course is in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class.
Please take into account that, beside the written documentation, also a practical component (such as a survey or an implementation of an application) is part of the course. Please examine the course description for the particular tasks.

The overall grade is composed as follows:

A total of 60 points can be achieved, of which

- A maximum of 30 points for the written documentation
- A maximum of 30 points for the practical component

In order to pass the success control, at least 15 points (written documentation / practical component) must be achieved.

Prerequisites
see below

Recommendations
None

Additional Information
All the practical seminars offered at the chair of Prof. Dr. Weinhardt can be chosen in the Special Topics in Information Systems course. The current topics of the practical seminars are available at the following homepage: www.iism.kit.edu/im/lehre.

The Special Topics Information Systems is equivalent to the practical seminar, as it was only offered for the major in "Information Systems" so far. With this course students majoring in "Industrial Engineering and Management" and "Economics Engineering" also have the chance of getting practical experience and enhance their scientific capabilities.

The Special Topics Information Systems can be chosen instead of a regular lecture (see module description). Please take into account, that this course can only be accounted once per module.

T 7.239 Module component: Statistical Modeling of Generalized Regression Models [T-WIWI-103065]

Coordinators: apl. Prof. Dr. Wolf-Dieter Heller
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101599 - Statistics and Econometrics
M-WIWI-105414 - Statistics and Econometrics II

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2521350	Statistical Modeling of Generalized Regression Models	2 SWS	Lecture	Heller
Exams					
WT 25/26	7900011	Statistical Modeling of Generalized Regression Models			Heller
WT 25/26	7900146 (WS23/24)	Statistical Modeling of generalized regression models			Heller

Assessment
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation.

Prerequisites
None

Recommendations
Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics" [2520016]

Below you will find excerpts from courses related to this module component:

V Statistical Modeling of Generalized Regression Models

2521350, WS 25/26, 2 SWS, Open in study portal

Lecture (V)

Content
Learning objectives:

The student has profound knowledge of generalized regression models.

Requirements:

Knowledge of the contents covered by the course *Economics III: Introduction in Econometrics" [2520016].*

Workload:

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

T 7.240 Module component: Statistics I [T-WIWI-102737]

Coordinators: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-100950 - Preliminary Exam
M-WIWI-101432 - Introduction to Statistics

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each summer term	1

Courses					
ST 2026	2600008	Statistics I	4 SWS	Lecture / 🗣	Grothe
Exams					
WT 25/26	7900022	Statistics I			Krüger
ST 2026	7900104	Statistics I			Grothe

Legend: 📱 Online, Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment

Success is assessed in the form of a written examination (120 minutes). The examination is offered towards the end of the lecture period or at the beginning of the lecture-free period. The repeat examination is offered in the following semester.

Bonus: It is planned that, from the summer semester 2025, a grade bonus for the Statistics I exam can be earned through successful participation in the tutorials. If the grade of the written exam is between 4.0 and 1.3, the bonus will generally improve the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the lecture.

Prerequisites

None

Below you will find excerpts from courses related to this module component:

V Statistics I

2600008, SS 2026, 4 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

Learning objectives:

Students understand and apply

- basic concepts of statistical data exploration as well as
- basic definitions and theorems of probability theory.

Content:

A. Descriptive Statistics: univariate und bivariate analysis

B. Probability Theory: probability space, conditional and product probabilities

C. Random variables: location and shape parameters, dependency measures, concrete distribution models

Workload:

Total workload for 5 CP: approx. 150 hours

Attendance: 60 hours

Preparation and follow-up: 90 hours

Literature

Skript: Kurzfassung Statistik I. Dieses enthält ausführliche Angaben zu weiterführender Literatur.

T 7.241 Module component: Statistics II [T-WIWI-102738]

Coordinators: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101432 - Introduction to Statistics

Type	Credits	Grading	Term offered	Version
Written examination	5 CP	graded	Each winter term	1

Courses					
WT 25/26	2610020	Statistics II	4 SWS	Lecture / 🗣	Krüger
WT 25/26	2610021		2 SWS	Tutorial	Krüger, Becker, Koster
WT 25/26	2610022	PC-Praktikum zu Statistik II	2 SWS		Krüger, Koster
Exams					
WT 25/26	7900001	Statistics II			Krüger
ST 2026	7900082	Statistics II			Krüger

Legend: 🖥 Online, ❖ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Success is assessed in the form of a written examination (120 minutes). The examination is offered towards the end of the lecture period or at the beginning of the lecture-free period. The repeat examination is offered in the following semester.
Bonus: It is planned that from the winter semester 2025/2026, a grade bonus for the Statistics II exam can be earned through successful participation in the tutorials. If the grade of the written examination is between 4.0 and 1.3, the bonus will generally improve the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the lecture.

Prerequisites
None

Recommendations
It ist recommended to attend the course *Statistics I* [2600008] before the course *Statistics II* [2610020].

Below you will find excerpts from courses related to this module component:

V Statistics II
2610020, WS 25/26, 4 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
Learning objectives:

The student

- understands and applies the basic definitions and theorems of probability theory,
- transfers these theoretical foundations to problems in parametric mathematical statistics.

Content:

D. Sampling and estimation theory: Sampling distributions, estimators, point and interval estimation
E. Test theory: General principles of hypothesis testing, specific 1- and 2-sample tests
F. Regression analysis: Simple and multiple linear regression, statistical inference

Requirements:

It is recommended to attend the course *Statistics I* [2600008] before the course *Statistics II* [2600020].

Workload:

Total workload: 150 hours (5.0 Credits).

Attendance: 60 hours

Preparation and follow-up: 90 hours

Literature
Skript: Kurzfassung Statistik II. Dieses enthält ausführliche Angaben zu weiterführender Literatur.

T 7.242 Module component: Strategic Decision-Making in Global Production Networks through Optimization and Simulation [T-MACH-114969]

Coordinators: Prof. Dr.-Ing. Gisela Lanza
Michael Martin

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-106590 - Production Engineering

Type	Credits	Grading	Term offered	Version
Examination of another type	4 CP	graded	Each summer term	2

Courses					
ST 2026	2150659	Strategic Decision-Making in Global Production Networks through Optimization and Simulation	2 SWS	Lecture / 🗣	Lanza, Martin

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment

The assessment of success takes the form of an examination with a different type of assessment in accordance with Section 4 (2) No. 3 of the SPO. The project work, two milestone-based presentations of the results in presentation form (each lasting approx. 20 minutes) and a final presentation (lasting approx. 30 minutes) are included in the assessment. The project work and the presentations are carried out in small groups.

Prerequisites

Depending on the degree program, one of the following partial achievements must be passed in order to register for an examination:
T-MACH-110991 - Global ProductionPartial achievement
T-MACH-105158 - Global Production and Logistics - Part 1: Global ProductionPartial
T-MACH-108848 - Global Production and Logistics - Part 1: Global Production
T-MACH-110337 - Global Production and LogisticsPartial
T-MACH-108849 - Integrated Production Planning in the Age of Industry 4.0
T-MACH-109054 - Integrated Production Planning in the Age of Industry 4.0
T-MACH-114031 - Global ProductionPartial service
T-MACH-113832 - Global ProductionPartial service
T-MACH-114800 - Global ProductionPartial service

The partial achievement T-MACH-113372 - Strategic Decision-Making in Global Production Network Design: A Seminar on Optimization and Simulation must not have been started for exam registration.

Recommendations

Participation in the following lectures:
Introduction to Operations Research I [2550040] + II [2530043]

Additional Information

The course is offered in English.

Workload

120 hours

Below you will find excerpts from courses related to this module component:

V Strategic Decision-Making in Global Production Networks through Optimization and Simulation

Lecture (V)
On-Site

2150659, SS 2026, 2 SWS, Language: English, Open in study portal

Content

The lecture "Strategic Decision-Making in Global Production Networks through Optimization and Simulation" offers students a comprehensive insight into the application of quantitative models from operations research in global production networks. The course places special emphasis on practical applications and allows students to deepen their skills through a real-world use case during the semester.

The classroom sessions serve to convey important basics and to introduce and present the practice-relevant cases. In the self-study phase, the topics covered are worked on in greater depth. The curriculum covers various phases. Optimization techniques for network design are covered first, followed by simulation methods for network management. Subsequently, open questions are dealt with, e.g. from the consideration of uncertainty, sustainability aspects or the search for the overall optimum in the production network.

The students are divided into small groups to work together on the questions. The methods taught in the course are implemented in python. In order to strengthen the students' presentation skills, regular presentations of interim results are planned. The progress made is supported by feedback and interaction with an internationally operating consulting firm.

The practical orientation of the course, combined with the application of quantitative models and the use of Python, enables students to prepare holistically for complex challenges in global production.

Learning Outcomes:

The students are able to

1. **put concepts of global production into practice:**
   • Understand how global production networks can be implemented in real business scenarios.
   • Develop and implement strategies for adapting global production networks to specific business requirements.
2. **in-depth knowledge and use of optimization in global production:**
   • Develop an in-depth understanding of various optimization techniques in global production processes.
   • Apply optimization models to complex production networks and continuously improve them.
3. **approach to improving network configuration, site selection and transportation routes:**
   • Understand methods to evaluate and optimize production networks.
   • Effectively plan and improve site selection decisions and transportation routes.
4. **deepen knowledge and use of simulations in global production:**
   • Understand how simulations can be used as a tool to analyze and optimize global production processes.
   • Gain experience in the application of simulation techniques for modeling and analyzing production processes.
5. **approach to improving delivery reliability:**
   • Develop and implement strategies to improve delivery reliability.
   • Optimize processes that can affect delivery reliability.
6. **consider uncertainties, aspects of sustainability and multidimensionality:**
   • Recognize and manage uncertainties in global production environments.
   • Consider sustainability aspects and multidimensional challenges when making decisions in global production.
7. **linking results and models:**
   • Link models and analytical results to create holistic solutions to complex problems in global production.
   • Strengthen the ability to iteratively improve models based on real-world results.
8. **presentations to management:**
   • Present complex global manufacturing concepts to management in an understandable and persuasive manner.
   • Build confidence in the use of visual aids and effective communication techniques in front of management levels.

Workload:

regular attendance: ~ 30 hours
self-study: ~ 99 hours

Media:

E-learning plattform Ilias, Powerpoint, photo protocol.
The Media are provided through Ilias (https://ilias.studium.kit.edu/).

Organizational issues

Aus organisatorischen Gründen ist die Teilnehmerzahl für die Lehrveranstaltung auf 20 Studierende begrenzt. Termine und Fristen zur Veranstaltung werden über die Homepage des wbk (https://www.wbk.kit.edu/studium-und-lehre.php) bekannt gegeben.

For organizational reasons the number of students is limited to 20. Dates and deadlines for the seminar will be announced via the homepage of wbk (https://www.wbk.kit.edu/studium-und-lehre.php).

Literature

Vorlesungsskript der Lehrveranstaltungen / Lecture notes of the courses:
Abele et al. (2008): Global Production [978-3-540-71652-5]
Domschke et al. (2015): Einführung in das Operations Research [Einführung in Operations Research]
Friedli et al. (2021): Global Manufacturing Management: From Excellent Plants Toward Network Optimization [978-3-030-72739-0]

T 7.243 Module component: Strategic Management [T-WIWI-113090]

Coordinators: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101425 - Strategy and Organization

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	2

Exams			
WT 25/26	7900199	Strategic Management	Lindstädt
ST 2026	7900067	Strategic Management	Lindstädt

Assessment
The assessment consists of a written exam (60 min) taking place at the beginn of the recess period (according to §4 (2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Workload
135 hours

T 7.244 Module component: Structural and Phase Analysis [T-MACH-102170]

Coordinators: Dr.-Ing. Susanne Wagner
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101262 - Emphasis Materials Science

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each winter term	1

Exams			
WT 25/26	76-T-MACH-102170	Structural and Phase Analysis	Wagner

Assessment
Oral examination

Prerequisites
none

T 7.245 Module component: Student2Startup [T-WIWI-114636]

Coordinators: Prof. Dr. Orestis Terzidis
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-107451 - Entrepreneurial Thinking and Action: Fundamentals of Entrepreneurship

Type	Credits	Grading	Term offered	Version
Examination of another type	4,5 CP	graded	Each winter term	1

Courses					
WT 25/26	2500165	Student2Startup	3 SWS	Seminar /	Böhrer, Terzidis
ST 2026	2500165	Student2Startup (Edition HAFIS)	3 SWS	Seminar /	Terzidis, Böhrer
Exams					
WT 25/26	7900309	Student2Startup			Terzidis
ST 2026	7900058	Student2Startup			Terzidis

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
The assessment is conducted as an alternative exam assessment. The specific form of assessment depends on the course and may include, for example, the following components:

- **Project Report or Reflection Paper**
- **Mid-term and Final Presentation**
- **Group Work with Individual Contribution**
- **Active Participation and Mandatory Attendance**

The overall grade is determined by the weighted evaluation of these individual assessment components. The detailed weighting of these components for grade calculation will be communicated to students at the beginning of the course.

Prerequisites
None

Recommendations
An interest in entrepreneurial thinking and action, teamwork, and interdisciplinary project work is recommended. Basic knowledge in business administration and/or innovation methods is helpful but not required.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Student2Startup
2500165, WS 25/26, 3 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content
Content:

This seminar offers a unique opportunity to engage in entrepreneurial tasks within real pre-seed start-up projects at KIT. The start-ups define specific challenges, and student teams will develop solutions and recommendations in response.

At the kick-off event, students will select a team challenge to work on. We will introduce a toolbox of methods and resources, after which you will work independently in teams, collaborating directly with the start-up. But you won't be on your own: each team will be supported by a mentor, and we will hold regular seminar sessions for feedback and guidance. At the end of the seminar, each team will present their results in a final pitch.

Learning Objectives:

After completing this course, the course participants will be able to

- Understand and apply fundamental concepts of entrepreneurship, such as business modelling, lean start-up methodologies, and market analysis.
- Work effectively in a team, organize the division of labor into distinct tasks, and coordinate efforts to achieve a common goal—gaining practical experience in project management.
- Recognize the specific challenges faced by start-up projects and acquire hands-on start-up experience.
- Collaborate with real start-up teams, industry experts, and potential users to develop solutions to a defined challenge.
- Present their solutions and results to start-ups and industry experts.

Exam:

Team presentation at the final event, detailed presentation appendix with background information, and active participation in all sessions

Target group:

Bachelor students

Organizational issues
Registration is via the Wiwi-Portal.

In the seminar, you will work on a project in teams of max five people. The groups are formed in the seminar.

V	**Student2Startup (Edition HAFIS)** 2500165, SS 2026, 3 SWS, Language: English, Open in study portal	**Seminar (S)** **Blended (On-Site/Online)**

Content

Content:

This seminar is a perfect complement to the *Entrepreneurship Basics* seminar. While you develop your own ideas in *Entrepreneurship Basics* within a protected environment, you will work on real entrepreneurial projects in this seminar. HAFIS teams at KIT consist of researchers who aim to maximize the impact of their research on society and the economy. This seminar offers a unique opportunity to engage with them by solving entrepreneurial and economic challenges within real KIT projects and by recommending suitable entrepreneurial activities:

The HAFIS teams define specific challenges, and student teams will develop solutions and recommendations in response. At the kick-off event, students will select a team challenge to work on. We will discuss and refine the necessary methods and activities (some of which are already covered in *Entrepreneurship Basics*), after which you will work independently in teams, collaborating directly with the HAFIS contact. However, you will not be on your own: each team will be supported by the lecturer through regular seminar sessions that provide feedback and guidance. At the end of the seminar, each team will present its results in a final pitch. To prepare for this, you will train your presentation skills through pitch training, a midterm pitch, and a dry run.

Learning Objectives:

After completing this course, the course participants will be able to

- Apply fundamental concepts of entrepreneurship, such as business modelling, lean start-up methodologies, and market analysis.
- Work effectively in a team, organize the division of labor into distinct tasks, and coordinate efforts to achieve a common goal, gaining practical experience in project management.
- Recognize the specific challenges faced by start-up projects and acquire hands-on start-up experience.
- Collaborate with real KIT projects and potential users to develop solutions to a defined challenge.
- Present solutions and recommendations.

Target group:

Bachelor students

In the seminar, you will work individually on your challenge in teams of up to five people. The groups will be formed at the seminar kick-off.

Teaching language: expected to be English.

Exam:

The team Pitch & Q&A session will be your main examination performance. Additionally, in written, you will document your Pitch and make a short team and personal reflection (till 25.07.2026).
Attendance at Kick-off and at the pitches is mandatory; one other seminar session may be missed for important reasons.

Dates and Topics:

Wednesday, 29.04.2026, 10:00 – 13:00 (K26) - Kick-off: Team Forming, All participants

Tuesday, 05.05.2026, 09:00 – 13:00: PM+Knowledge, All

Tuesday, 12.05.2026, 09:00 – 13:00: Feedback Session, 90 min, individual

Tuesday, 19.05.2026, 09:00 – 13:00: Pitch Training, All

Wednesday, 10.06.2026, 10:00 – 13:00 (K26): Midterm Pitch, All

Tuesday, 16.06.2026, 09:00 – 13:00: Feedback Session, 90 min, individual

Tuesday, 23.06.2026, 09:00 – 13:00: Feedback Session, 90 min, individual

Tuesday, 30.06.2026, 09:00 – 13:00: Feedback Session, 90 min, individual

Tuesday, 07.07.2026, 09:00 – 13:00: Dry Run, 90 min, individual

Wednesday, 15.07.2026, 9:00 – 13:00 (K26): Pitch & Q&A, All

Location (unless otherwise specified):

Bld. 06.35 Westhochschule - Bau 35 R 219, Hertzstraße 16

Module:

For wiwi students, the course is credited within the module *'**Entrepreneurial Thinking and Action: Fundamentals of Entrepreneurship**' (M-WIWI-107451)* with 4,5 ECTS.

You can complete the module by participating in our seminar Entrepreneurship Basics (4,5 ECTS, LV 2545010).

Organizational issues

Registration is via the Wiwi-Portal.

In the seminar, you will work on a project in teams of max five people. The groups are formed in the seminar.

Attention:

The dates are the following:

- Wed, 29.04.26 Kick-Off (10:00-13:00, K26) Team Forming (all)
- Tue, 05.05.26 Session 1 (09:30-13:00) PM+Knowledge (all)
- Tue, 12.05.26 Session 2 (09:30-13:00) Feedback Session (90 minutes, individual)
- Tue, 19.05.26 Session 3 (09:30-13:00) Pitch Training (all)
- Wed, 10.06.26 Session 4 (10:00-13:00, K26) Midterm Pitch (all)
- Tue, 16.06.26 Session 5 (09:30-13:00) Feedback Session (90 minutes, individual)
- Tue, 23.06.26 Session 6 (09:30-13:00) Feedback Session (90 minutes, individual)
- Tue, 30.06.26 Session 7 (09:30-13:00) Feedback Session (90 minutes, individual)
- Tue, 07.07.26 Session 8 (09:30-13:00) Dry Run (90 minutes, individual)
- Wed, 15.07.26 Final Pitch (09:00-13:00) Pitch & Q&A (all)

T 7.246 Module component: Supplement Applied Informatics [T-WIWI-110711]

Coordinators: Professorenschaft des Instituts AIFB
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101426 - Electives in Informatics

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each term	1

Assessment
The assessment of this course is a written or (if necessary) oral examination.

Depending on the particular course associated with this placeholder a bonus on the examination grade is possible.

Prerequisites
None

Additional Information
This course can be used in particular for the acceptance of external courses whose content is in the broader area of applied informatics, but is not equivalent to another course of this topic.

Workload
135 hours

T 7.247 Module component: Sustainability in E-Business [T-WIWI-114596]

Coordinators: Pascal Heßler
Prof. Dr. Jella Pfeiffer

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-101434 - eBusiness and Service Management
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each winter term	2

Courses					
WT 25/26	2540470	Sustainability in E-Business	3 SWS	Lecture / Practice / 🗣	Pfeiffer, Heßler, Schlaich
Exams					
WT 25/26	7900062	Sustainability in E-Business			Pfeiffer
ST 2026	7900024	Sustainability in E-Business (Nachklausur)			Pfeiffer

Legend: 🖥 Online, ⚄ Blended (On-Site/Online), 🗣 On-Site, x Cancelled

Assessment
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Prerequisites
None.

Additional Information
This lecture is in English.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Sustainability in E-Business

2540470, WS 25/26, 3 SWS, Language: English, Open in study portal

Lecture / Practice (VÜ)
On-Site

Content
This module explores the intersection of e-business and sustainability, emphasizing sustainable practices, circular economy, revenue models, marketing strategies, and emerging trends. The modul also includes the Value-Based Engineering (VBE), a well-being-driven approach to IT. VBE integrates ethical considerations into system design from the earliest stages of business mission definition. Students will gain a comprehensive understanding of how e-business adapts to and influences the drive for sustainable development.

The lecture is accompanied by a bi-weekly tutorial.

T 7.248 Module component: Sustainable Vehicle Drivetrains [T-MACH-111578]

Coordinators: Dr.-Ing. Olaf Toedter
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-101303 - Combustion Engines II

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each winter term	1

Courses					
WT 25/26	2133132	Sustainable Vehicle Drivetrains	3 SWS	Lecture / 🗣	Toedter
Exams					
WT 25/26	76-T-MACH-105655	Sustainable Vehicle Drivetrains			Toedter

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
oral exam (approx. 20 minutes)

Prerequisites
none

Additional Information
Starting in winter term 25/26, the course consists of a lecture (2h / week) and a tutorial (1 h / week).

This course is offered in German.

Workload
120 hours

T 7.249 Module component: Systematic Materials Selection [T-MACH-100531]

Coordinators: Dr.-Ing. Stefan Dietrich
Prof. Dr.-Ing. Volker Schulze

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101262 - Emphasis Materials Science

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	graded	Each summer term	6

Courses					
ST 2026	2174576	Systematic Materials Selection	3 SWS	Lecture / 🗣	Dietrich
ST 2026	2174577	Excercises in Systematic Materials Selection	1 SWS	Practice / 🗣	Dietrich
Exams					
WT 25/26	76-T-MACH-100531	Systematic Materials Selection			Dietrich
ST 2026	76-T-MACH-100531	Systematic Materials Selection			Dietrich

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment is carried out as a written exam of 2 h.

Prerequisites
none

Recommendations
Basic knowledge in materials science, mechanics and mechanical design due to the lecture Materials Science I/II.

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Systematic Materials Selection

2174576, SS 2026, 3 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
Important aspects and criteria of materials selection are examined and guidelines for a systematic approach to materials selection are deeloped. The following topics are covered:

- Information and introduction
- Necessary basics of materials
- Selected methods / approaches of the material selection
- Examples for material indices and materials property charts
- Trade-off and shape factors
- Sandwich materials and composite materials
- High temperature alloys
- Regard of process influences
- Material selection for production lines
- Incorrect material selection and the resulting consequences
- Abstract and possibility to ask questions

learning objectives:
The students are able to select the best material for a given application. They are proficient in selecting materials on base of performance indices and materials selection charts. They can identify conflicting objectives and find sound compromises. They are aware of the potential and the limits of hybrid material concepts (composites, bimaterials, foams) and can determine whether following such a concept yields a useful benefit.
requirements:

WiIng SPO 2007 (B.Sc.)

The course Material Science I [21760] has to be completed beforehand.

WiIng (M.Sc.)

The course Material Science I [21760] has to be completed beforehand.

workload:

The workload for the lecture is 120 h per semester and consists of the presence during the lecture (30 h) as well as preparation and rework time at home (30 h) and preparation time for the oral exam (60 h).

Literature
Vorlesungsskriptum; Übungsblätter; Lehrbuch: M.F. Ashby, A. Wanner (Hrsg.), C. Fleck (Hrsg.);
Materials Selection in Mechanical Design: Das Original mit Übersetzungshilfen
Easy-Reading-Ausgabe, 3. Aufl., Spektrum Akademischer Verlag, 2006
ISBN: 3-8274-1762-7

Lecture notes; Problem sheets; Textbook: M.F. Ashby, A. Wanner (Hrsg.), C. Fleck (Hrsg.);
Materials Selection in Mechanical Design: Das Original mit Übersetzungshilfen
Easy-Reading-Ausgabe, 3. Aufl., Spektrum Akademischer Verlag, 2006
ISBN: 3-8274-1762-7

T 7.250 Module component: Systems of Remote Sensing, Prerequisite [T-BGU-101637]

Coordinators: Prof. Dr. Jan Cermak
Prof. Dr.-Ing. Stefan Hinz
Dr.-Ing. Uwe Weidner

Organisation: KIT Department of Civil Engineering, Geo and Environmental Sciences

Part of: M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Grading	Term offered	Version
Coursework	1 CP	pass/fail	Each summer term	1

Courses					
ST 2026	6020242	Remote Sensing Systems, Excercise	1 SWS	Practice / On-Site	Pauli

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Prerequisites
None

Recommendations
None

Additional Information
None

Workload
30 hours

T 7.251 Module component: Tactical and Operational Supply Chain Management [T-WIWI-102714]

Coordinators: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101413 - Applications of Operations Research
M-WIWI-101421 - Supply Chain Management
M-WIWI-103278 - Optimization under Uncertainty

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	Each summer term	3

Courses					
ST 2026	2550486	Tactical and operational SCM	3 SWS	Lecture / 🗣	Nickel
ST 2026	2550487	Übungen zu Taktisches und operatives SCM	1.5 SWS	Practice / 🗣	Pomes, Hoffmann
Exams					
WT 25/26	7900094	Tactical and Operational Supply Chain Management			Nickel
ST 2026	7900239	Tactical and Operational Supply Chain Management			Nickel

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, × Cancelled

Assessment
Success is assessed in the form of a written examination (60 minutes). The examination is offered every semester and can be repeated at any regular examination date.

Successful participation in the online exercises is a prerequisite for admission to the written exam.

Prerequisites
Prerequisite for admission to examination is the succesful completion of the online assessments.

Recommendations
None

Additional Information
The lecture is held in every summer term. The planned lectures and courses for the next three years are announced online at https://dol.ior.kit.edu/Lehrveranstaltungen.php.

Workload
135 hours

Below you will find excerpts from courses related to this module component:

V Tactical and operational SCM

2550486, SS 2026, 3 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The planning of material transport is an essential element of Supply Chain Management. By linking transport connections across different facilities, the material source (production plant) is connected with the material sink (customer). The general supply task can be formulated as follows (cf. Gudehus): For given material flows or shipments, choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints. The main goal of the inventory management is the optimal determination of order quantities in terms of minimization of fixed and variable costs subject to resource constraints, supply availability and service level requirements. Similarly, the problem of lot sizing in production considers the determination of the optimal amount of products to be produced in a time slot. The course includes an introduction to basic terms and definitions of Supply Chain Management and a presentation of fundamental quantitative planning models for distribution, vehicle routing, inventory management and lot sizing. Furthermore, case
studies from practice will be discussed in detail.

Passing the online exercise is a prerequisite for admission to the exam.

Literature
Weiterführende Literatur

- Domschke: Logistik: Transporte, 5. Auflage, Oldenbourg, 2005
- Domschke: Logistik: Rundreisen und Touren, 4. Auflage, Oldenbourg, 1997
- Ghiani, Laporte, Musmanno: Introduction to Logistics Systems Planning and Control, Wiley, 2004
- Gudehus: Logistik, 3. Auflage, Springer, 2005
- Simchi-Levi, Kaminsky, Simchi-Levi: Designing and Managing the Supply Chain, 3rd edition, McGraw-Hill, 2008
- Silver, Pyke, Peterson: Inventory management and production planning and scheduling, 3rd edition, Wiley, 1998

7.252 Module component: Team Project Management and Technology [T-WIWI-110968]

Coordinators: Prof. Dr. Martin Klarmann
Prof. Dr. Alexander Mädche

Organisation: KIT Department of Business and Economics

Part of: M-WIWI-105440 - Team Project Management and Technology

Type	Credits	Grading	Term offered	Expansion	Version
Examination of another type	9 CP	graded	Each term	1 semesters	1

Courses					
WT 25/26	2571176	Team Project Management and Technology	6 SWS	Project /	Klarmann, Mädche
ST 2026	2571176	Teamprojekt Wirtschaft und Technologie		Project /	Klarmann, Mädche
Exams					
WT 25/26	7900207	Team Project Management and Technology			Mädche, Klarmann
ST 2026	7900048	Team Project Management and Technology			Klarmann, Mädche

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment

Alternative exam assessment. The basis for grading is the documents produced, the presentations during the course of the project, the artifact to be produced (e.g. algorithm, method, model, software, component) and the final presentation.

Workload

270 hours

T 7.253 Module component: Team Project Management and Technology (BUS/ENG) [T-WIWI-110977]

Coordinators: Prof. Dr. Martin Klarmann
Prof. Dr. Alexander Mädche
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-105447 - Team Project Management and Technology (BUS/ENG)

Type	Credits	Grading	Term offered	Expansion	Version
Examination of another type	9 CP	graded	Each term	1 semesters	1

Courses					
WT 25/26	2571176	Team Project Management and Technology	6 SWS	Project /	Klarmann, Mädche
ST 2026	2571176	Teamprojekt Wirtschaft und Technologie		Project /	Klarmann, Mädche
Exams					
WT 25/26	7900207	Team Project Management and Technology			Mädche, Klarmann
ST 2026	7900048	Team Project Management and Technology			Klarmann, Mädche

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment
Alternative exam assessment. The basis for grading is the documents produced, the presentations during the course of the project, the artifact to be produced (e.g. algorithm, method, model, software, component) and the final presentation.

Workload
270 hours

T 7.254 Module component: Tires and Wheel Development for Passenger Cars [T-MACH-102207]

Coordinators: Prof. Dr.-Ing. Günter Leister
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101265 - Vehicle Development

Type	Credits	Grading	Term offered	Version
Oral examination	3 CP	graded	Each summer term	1

Courses					
ST 2026	2114845	Tires and Wheel Development for Passenger Cars	2 SWS	Lecture / 🗣	Leister
Exams					
WT 25/26	76-T-MACH-102207	Tires and Wheel Development for Passenger Cars			Leister
ST 2026	76-T-MACH-102207	Tires and Wheel Development for Passenger Cars			Leister

Legend: 🖥 Online, ❂ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Prerequisites
none

Additional Information
The course is offered in German.

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Tires and Wheel Development for Passenger Cars

2114845, SS 2026, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

1. The role of the tires and wheels in a vehicle
2. Geometrie of Wheel and tire, Package, load capacity and endurance, Book of requirement
3. Mobility strategy, Minispare, runflat systems and repair kit.
4. Project management: Costs, weight, planning, documentation
5. Tire testing and tire properties
6. Wheel technology incuding Design and manifacturing methods, Wheeltesting
7. Tire presssure: Indirect and direct measuring systems
8. Tire testing subjective and objective

Learning Objectives:

The students are informed about the interactions of tires, wheels and chassis. They have an overview of the processes regarding the tire and wheel development. They have knowledge of the physical relationships.

Organizational issues
Vorlesung findet am Campus Ost, Geb.70.04 statt. Voraussichtliche Termine, nähere Informationen und eventuelle Terminänderungen:

siehe Institutshomepage.

Literature

Manuskript zur Vorlesung

Manuscript to the lecture

T 7.255 Module component: Topics in Human Resource Management [T-WIWI-111858]

Coordinators: Prof. Dr. Petra Nieken
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-105928 - HR Management & Digital Workplace
M-WIWI-106860 - Leadership & Sustainable HR-Management

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each term	1

Courses					
WT 25/26	2573015	Topics in Human Resource Management	2 SWS	Colloquium / 🗣	Nieken
ST 2026	2573015	Topics in Human Resource Management	2 SWS	Colloquium / 🗣	Nieken, Mitarbeiter

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, × Cancelled

Assessment
Alternative exam assessment.

The grade is made up of the presentation of a given research topic and active participation in the discussions in the course. The weighting depends on the course and will be announced at the beginning of the course.

Prerequisites
This course cannot be combined with T-WIWI-102871 "Problem Solving, Communication and Leadership".

Recommendations
We recommend visiting the course "Human Resource Management" before taking this course.
The course is strongly recommended for students interested in empirical research in the areas HRM, personnel economics, and leadership.

Workload
90 hours

Below you will find excerpts from courses related to this module component:

V Topics in Human Resource Management

2573015, WS 25/26, 2 SWS, Language: German, Open in study portal

Colloquium (KOL)
On-Site

Content
The students will discuss and analyze selected research papers in the areas HRM, personnel economics, and leadership. The students will present research papers and discuss research methods and designs as well as content.

Aim

The student

- Looks into current research topics in the areas HRM, personnel economics, and leadership.
- Analyzes research papers in detail and evaluates the research outcomes.
- Trains their presentation skills.
- Learns to critically evaluate research methods and trains the scientific discussion culture.
- Gains deeper knowledge in the area of HRM.
- Learns to evaluate research designs and takes into account the ethical dimension of research.

Notes

Due to the interactive nature of the course, the number of participants is limited. If you are interested, please contact Prof. Nieken by email.

Workload

The total workload for this course is approximately 90 hours.

Lecture: 30 hours

Preparation: 45 hours

Exam preparation: 15 hours

Literature

Selected research papers

Organizational issues
Die Veranstaltung findet als Blockveranstaltung statt. Termine werden noch bekannt gegeben.

V **Topics in Human Resource Management** — **Colloquium (KOL) On-Site**
2573015, SS 2026, 2 SWS, Language: German, Open in study portal

Content
The students will discuss and analyze selected research papers in the areas HRM, personnel economics, and leadership. The students will present research papers and discuss research methods and designs as well as content.

Aim

The student

- Looks into current research topics in the areas HRM, personnel economics, and leadership.
- Analyzes research papers in detail and evaluates the research outcomes.
- Trains their presentation skills.
- Learns to critically evaluate research methods and trains the scientific discussion culture.
- Gains deeper knowledge in the area of HRM.
- Learns to evaluate research designs and takes into account the ethical dimension of research.

Notes

Due to the interactive nature of the course, the number of participants is limited. If you are interested, please contact Prof. Nieken by email.

Workload

The total workload for this course is approximately 90 hours.

Lecture: 30 hours

Preparation: 45 hours

Exam preparation: 15 hours

Literature

Selected research papers

Organizational issues
Geb. 05.20, Raum 2A-25, Termine werden bekannt gegeben

T 7.256 Module component: Tutorial Mathematical Methods in Hydraulics [T-MACH-113913]

Coordinators: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-101266 - Automotive Engineering
M-MACH-101267 - Mobile Machines

Type	Credits	Grading	Term offered	Expansion	Version
Coursework	2 CP	pass/fail	Each winter term	1 semesters	1

Exams			
WT 25/26	76-T-MACH-113913	Mathematical Methods in Hydraulics - Advance	Geimer

Assessment
Successful completion of Ilias tests. Details will be announced in the first lecture.

Prerequisites
none

Additional Information
See "Mathematical methods of hydraulics".

The course is offered in German.

Workload
60 hours

7.257 Module component: Tutorial Simulation with Lumped Parameters [T-MACH-113863]

Coordinators: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-101265 - Vehicle Development
M-MACH-101267 - Mobile Machines

Type	Credits	Grading	Term offered	Expansion	Version
Coursework	1 CP	pass/fail	Each summer term	1 semesters	1

Courses					
ST 2026	2114072	Simulation with Lumped Parameters (Tutorial)	2 SWS	Practice / 🗣	Geimer

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Submission of a report at the end of the lecture period.

Prerequisites
none

Recommendations
Knowledge of mechanics and hydraulics

Additional Information
This tutorial is a prerequisite for the module components T-MACH-113862 - Simulation with concentrated parameters (examination) in the MSc Mechanical Engineering program (SPO 2025).

The course is offered in German.

Workload
30 hours

T 7.258 Module component: Vehicle Drive Technology [T-MACH-113997]

Coordinators: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-101267 - Mobile Machines

Type	Credits	Grading	Term offered	Expansion	Version
Oral examination	4 CP	graded	Each winter term	1 semesters	1

Courses					
WT 25/26	2113091	Machine Drive Technology	2 SWS	Lecture / 🗣	Geimer
WT 25/26	2113095	Exercise Machine Drive Technology	2 SWS	Practice / 🗣	Geimer
Exams					
WT 25/26	76-T-MACH-113997	Vehicle Drive Technology			Geimer
ST 2026	76-T-MACH-113997	Vehicle Drive Technology			Geimer

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
Oral examination, duration approx. 20 minutes

Prerequisites
none

Additional Information
The course is offered in German

Workload
120 hours

Below you will find excerpts from courses related to this module component:

V Machine Drive Technology

2113091, WS 25/26, 2 SWS, Open in study portal

Lecture (V)
On-Site

Content
This lecture presents and discusses the possible variations of the traction drive trains of mobile machinery. The focus of the lecture is as follows:
-Mechanical transmissions
-Hydrodynamic converters
-Hydrostatic drives
-Power-split transmissions
-Electric drives
-Hybrid drives
-axles
-Terra mechanics (wheel-ground effects)

Organizational issues
Findet am Campus Ost, Geb. 70.04, Raum 219 statt.

T 7.259 Module component: Welfare Economics [T-WIWI-102610]

Coordinators: Prof. Dr. Clemens Puppe
Organisation: KIT Department of Business and Economics
Part of: M-WIWI-101501 - Economic Theory

Type	Credits	Grading	Term offered	Version
Written examination	4,5 CP	graded	see Annotations	3

Exams			
WT 25/26	7900086	Welfare Economics	Puppe

Assessment
The assessment consists of a written exam (60 min.).

Prerequisites
The course *Economics I: Microeconomics* [2610012] has to be completed beforehand.

Recommendations
None

Additional Information
The course only takes place every second summer semester, the next course is planned for summer semester 2027. The last iteration of this course is expected to take place in the summer semester of 2029. The last exam will therefore be offered in the summer semester of 2030.

T 7.260 Module component: Workshop Mechatronical Systems and Products [T-MACH-112648]

Coordinators:	Prof. Dr.-Ing. Sören Hohmann Prof. Dr.-Ing. Sven Matthiesen
Organisation:	KIT Department of Mechanical Engineering
Part of:	M-MACH-106236 - Mechatronic Product Design

Type	Credits	Grading	Term offered	Version
Coursework	5 CP	pass/fail	Each winter term	2

Courses					
WT 25/26	2145162	Workshop Mechatronical Systems and Products	3 SWS	Practical course / 🗣	Matthiesen, Hohmann, Teltschik
Exams					
WT 25/26	76-T-MACH-112648	Titel (Enlisch): Workshop Mechatronical Systems and Products (mach/etit/wiwi)			Hohmann, Matthiesen

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Assessment
The assessment is carried out in the form of a course achievement consisting of a semester-long workshop.
The partial achievement is not graded. It is considered passed upon successful evaluation of the course achievement.

Throughout the semester, accompanying the workshop, submission tasks are required at given milestones. These tasks assess the application of knowledge developed within the module. Examples of such submissions include CAD designs, control software, and reflection reports, which are specified in a workshop assignment at the beginning of the semester. The milestones are announced in a calendar at the start of the semester and are made available to students via ILIAS.

Prerequisites
None

Knowledge of the contents of the lecture Mechatronische Systeme und Produkte [T-MACH-105574] will be assumed to be known.

Additional Information
All relevant materials (script, exercise sheets, etc.) for the course can be accessed via the eLearning platform ILIAS.

To participate in the course, please complete the survey, registration and group allocation in ILIAS before the start of the semester.

The course is offered in German.

Workload
150 hours