

Module Handbook Information Systems B.Sc.

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KIT DEPARTMENT OF BUSINESS AND ECONOMICS / KIT DEPARTMENT OF INFORMATICS



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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 persons

for Bachelor students

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2 General Information

2.1 Study program details

KIT-Department	KIT Department of Business and Economics / KIT Department of Informatics
Academic Degree	Bachelor of Science (B.Sc.)
Examination Regulations Version	2019
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.wirtschaftsinformatik.kit.edu/studiengang.php Department www.wirtschaftsinformatik.kit.edu/studiengang.php

2.2 Content

KIT's Information Systems Program is characterized by practiced real interdisciplinarity based on an interdepartmental model. The contents of studies in the first four semesters are organized in five focus areas:

1. Information Systems (basic concepts of information systems, concepts and systems for digitalization on the levels of the individual, group, organization, and market).
2. Informatics (basic concepts of informatics, programming, algorithms, theoretical basics, communication and data storage, applied informatics, software technology).
3. Mathematics & Statistics (linear algebra, analysis, development of mathematical models, descriptive statistics, probability theory, elements of estimation and testing theory).
4. Economics and Management (business administration, marketing, production, finance and accounting, operations research, and economics).
5. Law (basics of the Civil Code, public law, trade law).

The team project "software development" in the 5th semester implements the research-based teaching concept and ensures high practical relevance of the studies. In teams, students develop a functioning application software using latest methods and tools. The program is complemented by a variety of electives offered by the KIT Department of Business and Economics and the KIT Department of Informatics. In this way, students are given the opportunity to specialize as desired during Bachelor's studies already. Students can decide in favor of a focus with 9 or 18 credits in Informatics or Economics and Management.

The contents of the studies are structured in a modular way.

In the subjects of Informatics and Economics/Management, modules in the total amount of 94 credits have to be passed.

Transferable skills in the amount of 6 credits are imparted mainly in the modules of Information Systems I, Programming, team project, and Bachelor's Thesis.

2.3 Qualification Goals

Thanks to the basic methodological knowledge acquired, graduates can name specific basic concepts, methods, models, and approaches and use them in an interdisciplinary way.

They can identify, describe, and communicate problems and topics of economics and management, information technology, and law. Along this range of topics, they can plan, analyze, compare, evaluate, and optimize information systems and infrastructures in business and society. They make decisions, develop specific solutions, and implement their innovative ideas using methods and models from the different disciplines taking into account the given resources. Graduates can document, present, validate, assess, and assure the quality of the results obtained. KIT's graduates of the Bachelor's program in Information Systems are capable of executing a corresponding task in industry, in the services sector, or in the trades sector, of establishing an own business, or starting Master's studies in Information Systems or a related subject.

2.4 Employment Prospects

How is digitalization changing companies and society? How can operational processes be optimized through the use of digital technologies? How can data be analyzed and protected? You will deal with all these questions and many more during and after your Bachelor's degree in Information Systems.

You will be optimally prepared for these questions, as you will not only have in-depth knowledge in the fields of computer science and economics, but also the necessary knowledge of legal issues, which is a particular feature of the course.

After completing their Bachelor's degree, many students go on to complete a Master's degree in order to further deepen their individual specialization. However, it is also possible to start a career after the Bachelor's degree. Whether in consulting firms or the high-tech industry - after completing your Bachelor's degree at KIT, you will be a sought-after specialist and manager and shape the digital economy.

2.5 Acceptance Criteria

The program offers 167 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 Information Systems](#)

2.7 Organizational issues

Current information on the degree programs as well as dates for information events and examinations can be found on the websites of the [KIT Department of Business and Economics](#) and the [KIT Department of Informatics](#).

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

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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 KIT department website](#).

Frequently asked questions

Answers to frequently asked questions from A for "Abschlussarbeit" to Z for "Zweitwiederholung" can be found in the [Hints A-Z](#) of the KIT Department of Business and Economics and the [FAQs](#) of the KIT Department of Informatics.

3 Study plan

The Bachelor's programme in Information Systems has a standard study period of six semesters and comprises 180 credit points. The basic area in the first four semesters is methodically oriented. In the fifth and sixth semesters, students deepen their specialist knowledge, which can be structured according to personal interests and goals within the curriculum.

Figure 2 shows the subject and module structure with the allocation of credit points (LP) and, as an example, a possible distribution of modules and courses in the basic area over the semesters.

Semester	Leistungs- punkte	Wirtschaftsinformatik	Informatik	Mathematik	Wirtschaftswissenschaften	Rechtswissenschaften	Seminar	Abschlussarbeit
1 (WS)	33	Wirtschaftsinformatik I 4 LP	Grundbegriffe der Informatik* 6 LP Programmieren* 5 LP	Mathematik I* 8 LP	Volkswirtschaftslehre 5 LP	Einführung in das Privatrecht 5 LP		
2 (SS)	29,5	Wirtschaftsinformatik II 4 LP	Algorithmen I 6 LP	Mathematik II* 8 LP	Einführung in das Operations Research 9 LP			
3 (WS)	28,5		Theoretische Informatik 6 LP	Einführung in die Statistik 10 LP				
4 (SS)	30		Angewandte Informatik 8 LP		Betriebswirt- schaftslehre 8 LP	Wirtschafts- privatrecht 9 LP		
			Datenbanksysteme 4 LP			Verfassungs- und Verwal- tungsrecht 6 LP		
			Einführung in Rechnernetze 4 LP					
			Softwaretechnik I* 6 LP					
5 (WS)	30,5	Teamprojekt Softwareentwicklung 8 LP	1-2 Wahlmodule 9/18 LP		1-2 Wahlmodule 9/18 LP	Wahlmodul 6 LP	Seminarmodul 3 LP	
6 (SS)	28,5							Bachelorarbeit 15 LP
	180	16	54-63	26	31-40	26	3	15

Figure 2: Recommended structure and subject structure of the bachelor's programme in Information Systems (german)

In the first four semesters, the modules illustrated from the subjects Information Systems, Informatics, Mathematics, Economics and Law are compulsory.

In the fifth and sixth semesters, elective modules of 9 to 18 credit points must be completed in the subjects of Informatics and Economics. In the subject Law, one or more modules with a total of 6 credit points must be selected. A software development project with 5 credit points is to be completed in the subject Information Systems. Key qualifications are taught integratively. The bachelor thesis comprises 15 credit points and is planned for the 6th semester.

It is up to the individual study plan (taking into account the relevant requirements in the study and examination regulations as well as any module regulations) in which semester the selected module examinations are started or completed.

4 Study Program Structure

Mandatory	
Bachelor's Thesis	15 CP
Orientation Exam <i>This field will not influence the calculated grade of its parent.</i>	
Information Systems	16 CP
Informatics <i>First usage possible until Sep 30, 2026.</i>	54-63 CP
Informatics <i>First usage possible from Oct 01, 2026.</i>	54-63 CP
Mathematics	26 CP
Economics and Management	31-40 CP
Law	26 CP
Seminars	3 CP

4.1 Bachelor's Thesis

Credits
15

Mandatory					
M-INFO-104875	Bachelor's Thesis	DE/EN	WS+SS	15 CP	

4.2 Orientation Exam

Mandatory					
M-WIWI-104843	Orientation Exam	DE	WS+SS	0 CP	

4.3 Information Systems

Credits
16

Mandatory					
M-INFO-104809	Team Project Software Development	DE	WS+SS	8 CP	
M-WIWI-104820	Information Systems I	DE	WS	4 CP	
M-WIWI-104821	Information Systems II	DE	SS	4 CP	

4.4 Informatics

Credits
54-63

Note regarding usage

First usage possible until Sep 30, 2026.

Election notes

In Informatics, in addition to the compulsory modules, optional modules with a total of 9 or 18 credit points must be completed. If elective modules totalling 18 LP are chosen, only elective modules totalling 9 credit points can be taken in the subject of Economics and Management.

Mandatory				
M-INFO-100030	Algorithms I	DE	SS	6 CP
M-WIWI-101430	Applied Informatics	DE	WS+SS	8 CP
M-INFO-104921	Database Systems	DE	SS	4 CP
M-INFO-103455	Introduction in Computer Networks	DE	SS	4 CP
M-INFO-101170	Basic Notions of Computer Science	DE	WS	6 CP
M-INFO-101174	Programming	DE	WS	5 CP
M-INFO-101175	Software Engineering I	DE	SS	6 CP
M-INFO-101189	Theoretical Informatics	DE/EN	WS	6 CP
Compulsory Elective Modules in Informatics (Elective: between 9 and 18 credits)				
M-INFO-101220	Algorithms for Planar Graphs	DE	Irreg.	5 CP
M-INFO-107201	Algorithms II	EN	WS	6 CP
M-INFO-101865	Lab: Working with Database Systems	DE	WS	4 CP
M-INFO-101184	Mobile Robots – Practical Course	DE/EN	SS	4 CP
M-INFO-101247	Lab Protocol Engineering	DE	WS	4 CP
M-INFO-101219	Practical Course Computer Engineering: Hardware Design	DE/EN	WS	4 CP
M-INFO-101633	Practical Course Web Applications and Service-Oriented Architectures (I)	DE	WS	5 CP
M-INFO-101230	Basic Practical Course for the ICPC-Programming Contest	DE	SS	4 CP
M-INFO-106311	Practical Course: Managing Scientific Data	DE	Irreg.	4 CP
M-INFO-101177	Operating Systems	DE	WS	6 CP
M-INFO-100856	Computer Graphics	DE	WS	6 CP
M-INFO-106291	Digital Games	DE	SS	6 CP
M-INFO-102978	Digital Circuits Design	DE	SS	6 CP
M-INFO-100799	Formal Systems	DE	WS	6 CP
M-WIWI-101476	Business Processes and Information Systems	DE	WS+SS	9 CP
M-INFO-106014	Introduction to Artificial Intelligence	DE	WS	5 CP
M-INFO-107166	Human Computer Interaction	EN	SS	6 CP
M-INFO-106327	Informatics Seminar	DE/EN	WS+SS	3 CP
M-INFO-106015	Information Security	DE	SS	5 CP
M-WIWI-107688	Information Security: Theory and Practice neu	DE	WS+SS	9 CP
M-INFO-102557	Lego Mindstorms - Practical Course	DE	WS	4 CP
M-INFO-101245	MARS-Based Internship	DE/EN	WS+SS	4 CP
M-INFO-100757	Mechano-Informatics and Robotics	DE/EN	WS	4 CP
M-INFO-101183	Microprocessors I	DE	SS	3 CP
M-INFO-101249	Mobile Computing and Internet of Things	DE	WS	5 CP
M-INFO-101179	Programming Paradigms neu	DE	WS	6 CP
M-INFO-103179	Computer Organization	DE	WS	6 CP
M-INFO-100818	Computer Architecture	DE	SS	6 CP
M-INFO-107162	Robotics I - Introduction to Robotics	EN	WS	6 CP
M-WIWI-101438	Semantic Knowledge Management	DE/EN	WS+SS	9 CP
M-INFO-107235	Software Engineering II	EN	SS	6 CP
M-INFO-107243	Telematics	EN	WS	6 CP
M-INFO-107682	Visual Computing neu	DE	SS	3 CP
M-INFO-101636	Web Applications and Service-Oriented Architectures (I)	DE	WS	4 CP

4.5 Informatics

Credits
54-63**Note regarding usage**

First usage possible from Oct 01, 2026.

Mandatory				
M-INFO-100030	Algorithms I neu	DE	SS	6 CP
M-WIWI-101430	Applied Informatics neu	DE	WS+SS	8 CP
M-INFO-101170	Basic Notions of Computer Science neu	DE	WS	6 CP
M-INFO-101174	Programming neu	DE	WS	5 CP
Compulsory Elective Modules in Informatics (Elective: between 9 and 18 credits)				
M-INFO-101220	Algorithms for Planar Graphs neu	DE	Irreg.	5 CP
M-INFO-107201	Algorithms II neu	EN	WS	6 CP
M-INFO-101865	Lab: Working with Database Systems neu	DE	WS	4 CP
M-INFO-101184	Mobile Robots – Practical Course neu	DE/EN	SS	4 CP
M-INFO-101247	Lab Protocol Engineering neu	DE	WS	4 CP
M-INFO-101219	Practical Course Computer Engineering: Hardware Design neu	DE/EN	WS	4 CP
M-INFO-101633	Practical Course Web Applications and Service-Oriented Architectures (I) neu	DE	WS	5 CP
M-INFO-101230	Basic Practical Course for the ICPC-Programming Contest neu	DE	SS	4 CP
M-INFO-106311	Practical Course: Managing Scientific Data neu	DE	Irreg.	4 CP
M-INFO-101177	Operating Systems neu	DE	WS	6 CP
M-INFO-100856	Computer Graphics neu	DE	WS	6 CP
M-INFO-106291	Digital Games neu	DE	SS	6 CP
M-INFO-102978	Digital Circuits Design neu	DE	SS	6 CP
M-INFO-100799	Formal Systems neu	DE	WS	6 CP
M-WIWI-101476	Business Processes and Information Systems neu	DE	WS+SS	9 CP
M-INFO-106014	Introduction to Artificial Intelligence neu	DE	WS	5 CP
M-INFO-107166	Human Computer Interaction neu	EN	SS	6 CP
M-INFO-106327	Informatics Seminar neu	DE/EN	WS+SS	3 CP
M-INFO-106015	Information Security neu	DE	SS	5 CP
M-WIWI-107688	Information Security: Theory and Practice neu	DE	WS+SS	9 CP
M-INFO-102557	Lego Mindstorms - Practical Course neu	DE	WS	4 CP
M-INFO-101245	MARS-Based Internship neu	DE/EN	WS+SS	4 CP
M-INFO-100757	Mechano-Informatics and Robotics neu	DE/EN	WS	4 CP
M-INFO-101183	Microprocessors I neu	DE	SS	3 CP
M-INFO-101249	Mobile Computing and Internet of Things neu	DE	WS	5 CP
M-INFO-101179	Programming Paradigms neu	DE	WS	6 CP
M-INFO-103179	Computer Organization neu	DE	WS	6 CP
M-INFO-100818	Computer Architecture neu	DE	SS	6 CP
M-INFO-107162	Robotics I - Introduction to Robotics neu	EN	WS	6 CP
M-WIWI-101438	Semantic Knowledge Management neu	DE/EN	WS+SS	9 CP
M-INFO-107235	Software Engineering II neu	EN	SS	6 CP
M-INFO-107243	Telematics neu	EN	WS	6 CP
M-INFO-107682	Visual Computing neu	DE	SS	3 CP
M-INFO-101636	Web Applications and Service-Oriented Architectures (II) neu	DE	WS	4 CP

4.6 Mathematics**Credits**
26

Mandatory				
M-WIWI-101432	Introduction to Statistics	DE	WS+SS	10 CP
M-MATH-104914	Mathematics I	DE	WS	8 CP
M-MATH-104915	Mathematics II	DE	SS	8 CP

4.7 Economics and Management

Credits
31-40

Election notes

In addition to the compulsory modules, one or two modules of 9 credit points each in Business Administration, Economics, Operations Research and Statistics must be completed. If two optional modules with a total of 18 credit points are chosen, only optional modules with a total of 9 credit points can be completed in Informatics.

Mandatory				
M-WIWI-105267	Business Administration	DE	WS+SS	8 CP
M-WIWI-101418	Introduction to Operations Research	DE	SS	9 CP
M-WIWI-101431	Economics	DE	WS+SS	5 CP
Business Administration (Elective:)				
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-105414	Statistics and Econometrics II	DE/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
Operations Research (Elective:)				
M-WIWI-101413	Applications of Operations Research	DE	WS+SS	9 CP
M-WIWI-101936	Methodical Foundations of OR	DE	WS+SS	9 CP
M-WIWI-103278	Optimization under Uncertainty	DE	WS+SS	9 CP
Statistics (Elective:)				
M-WIWI-101599	Statistics and Econometrics	DE/EN	WS+SS	9 CP
Economics (Elective:)				
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-101668	Economic Policy I	DE/EN	WS+SS	9 CP
M-WIWI-101501	Economic Theory	DE/EN	WS+SS	9 CP

4.8 Law**Credits**
26

Mandatory				
M-INFO-101190	Introduction to Civil Law	DE	WS	5 CP
M-INFO-101191	Commercial Law	DE	WS+SS	9 CP
M-INFO-105247	Constitutional and Administrative Law <i>First usage possible until Apr 08, 2026.</i>	DE	WS+SS	6 CP
M-INFO-107555	German and European Public Law neu <i>First usage possible from Apr 10, 2026.</i>	DE	WS+SS	6 CP
Compulsory Elective Module in Law (Elective: at least 6 credits)				
M-INFO-101253	Intellectual Property and Data Protection	DE	WS	6 CP

4.9 Seminars**Credits**
3

Compulsory Elective Seminar in Informatics (Elective: at most 3 credits)				
M-WIWI-107691	Seminar Module Applied Informatics neu	DE/EN	WS+SS	3 CP
M-INFO-101218	Seminar Module Law	DE	WS+SS	3 CP
M-WIWI-101826	Seminar Module Economic Sciences	DE	WS+SS	3 CP
M-INFO-107152	Humanoid Robots - Seminar neu	EN	WS	3 CP
M-INFO-102555	Motion in Human and Machine - Seminar neu	EN	SS	3 CP
M-INFO-106495	Research Practical Course: Explainable Artificial Intelligence neu	EN	WS	6 CP
M-INFO-106813	Research Seminar in Selected Topics in Statistical Learning and Data Science neu	EN	Irreg.	3 CP
M-INFO-102375	Seminar Image Analysis and Fusion neu	DE	SS	3 CP
M-INFO-102662	Seminar Dependable Computing neu	EN	WS+SS	3 CP
M-INFO-103048	Seminar Decentralized Systems and Network Services neu	DE	Irreg.	3 CP
M-INFO-107242	Seminar in Privacy neu	EN	SS	4 CP
M-INFO-103078	Seminar: Designing and Conducting Experimental Studies neu	DE	Irreg.	4 CP
M-INFO-107353	Seminar: Advanced Topics in Natural Language Processing neu	EN	WS+SS	3 CP
M-INFO-107209	Seminar: Advanced Topics on SAT Solving neu	EN	WS	3 CP
M-INFO-106086	Seminar: Algorithm Engineering neu	EN	Irreg.	4 CP
M-INFO-106490	Seminar: Artificial Intelligence for Energy Systems neu	EN	WS	4 CP
M-INFO-106958	Seminar: Critical Topics in AI neu	EN	SS	3 CP
M-INFO-107175	Seminar: Deep Learning for Robotics neu	EN	WS	3 CP
M-INFO-107231	Seminar: Embedded Systems I neu	EN	WS+SS	3 CP
M-INFO-107232	Seminar: Embedded Systems II neu	EN	WS+SS	3 CP
M-INFO-103153	Seminar: Energy Informatics neu	DE/EN	Irreg.	4 CP
M-INFO-106927	Seminar: Exoskeletons & Motion Capture neu	EN	WS	3 CP
M-INFO-106497	Seminar: Explainable Artificial Intelligence neu	EN	WS	3 CP
M-INFO-106651	Seminar: Exploring Robotics - Insights from Science Fiction, Research and Society neu	EN	SS	3 CP
M-INFO-107436	Seminar: Failing Forward: Robotics, Critical Reading and the Making of Good Research neu	EN	WS	3 CP
M-INFO-106594	Seminar: Research Trends in Human-Computer Interaction neu	DE/EN	WS+SS	3 CP
M-INFO-102729	Seminar: Advanced Algorithms in Computer Graphics neu	DE	WS	3 CP
M-INFO-106868	Seminar: Hot Topics in Artificial Intelligence & Security 1 neu	EN	WS	4 CP
M-INFO-106869	Seminar: Hot Topics in Artificial Intelligence & Security 2 neu	EN	SS	4 CP
M-INFO-100750	Seminar: Hot Topics in Bioinformatics neu	EN	SS	3 CP
M-INFO-106392	Seminar: Hot Topics in Explainable Artificial Intelligence (XAI) neu	EN	SS	4 CP
M-INFO-105328	Seminar: Computer Science TECO neu	DE/EN	Irreg.	3 CP
M-INFO-107686	Seminar: Information Systems neu	EN	WS+SS	3 CP
M-INFO-107217	Seminar: Interpretability and Causality in Machine Learning neu	EN	SS	3 CP
M-INFO-106356	Seminar: AI Systems Engineering neu	DE/EN	Irreg.	4 CP
M-INFO-107033	Seminar: Learning Causality - a Challenge for Human and Artificial Intelligence neu	DE	SS	3 CP
M-INFO-102412	Seminar: Neural Networks and Artificial Intelligence neu	EN	WS	3 CP
M-INFO-107264	Seminar: Practical Graph Algorithms neu	EN	Irreg.	4 CP
M-INFO-107216	Seminar: Privacy and Security neu	EN	WS	4 CP
M-INFO-103306	Seminar: Proofs from THE BOOK neu	EN	Irreg.	3 CP
M-INFO-107172	Seminar: Recent Highlights in Algorithms neu	EN	Irreg.	4 CP
M-INFO-105379	Seminar: Robot Reinforcement Learning neu	DE	Irreg.	3 CP
M-INFO-105761	Seminar: Secure Multiparty Computation neu	EN	Irreg.	3 CP
M-INFO-102372	Seminar: Service-Oriented Architectures neu	DE	WS+SS	3 CP
M-INFO-107236	Seminar: Software Architecture, Security and Privacy neu	EN	Irreg.	4 CP
M-INFO-105895	Seminar: Software Quality Assurance and Software Test neu	DE/EN	SS	4 CP
M-INFO-107179	Seminar: Speech-to-Speech Translation neu	EN	SS	3 CP

M-INFO-101880	Seminar: Ubiquitous Systems neu	DE	WS+SS	4 CP
M-INFO-102305	Seminar: From Big Data to Data Science: Advanced Methods of Information Fusion neu	DE/EN	WS+SS	3 CP

5 Modules

M

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

Coordinators: Prof. Dr. Johannes Brumm
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Economics\)](#)

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

Compulsory Elective Courses (Elective:)			
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.

M

5.2 Module: Algorithms for Planar Graphs [M-INFO-101220]

Coordinators: Dr. rer. nat. Torsten Ueckerdt
Organisation: KIT Department of Informatics
Part of: [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)

Credits
5 CP

Grading
graded

Recurrence
Irregular

Duration
1 term

Language
German

Level
3

Version
2

Mandatory			
T-INFO-101986	Algorithms for Planar Graphs	5 CP	Ueckerdt
T-INFO-114999	Algorithms for Planar Graphs - Pass	0 CP	Ueckerdt

Content

A planar graph is defined as a graph that can be drawn in the plane such that no edges intersect. Planar graphs have many interesting properties that can be used to solve several problems in a particularly simple, fast and elegant way. In addition, some problems that are (NP-)hard in general graphs can be efficiently solved in planar graphs. The lecture presents a selection of these problems and corresponding algorithmic approaches.

Additional Information

The module is offered irregularly.

Workload

2 SWS lecture, 1 SWS exercise, 5 CP corresponds to **150h** divided into

30h lecture attendance

15h exercise

40h follow-up

25h solving the exercises

40h exam preparation

M

5.3 Module: Algorithms I [M-INFO-100030]

Coordinators: TT-Prof. Dr. Thomas Bläsius
Organisation: KIT Department of Informatics
Part of: [Informatics \(mandatory\)](#)
[Informatics \(mandatory\)](#)

Credits
6 CP

Grading
graded

Recurrence
Each summer term

Duration
1 term

Language
German

Level
1

Version
1

Mandatory			
T-INFO-100001	Algorithms I	6 CP	Bläsius

M

5.4 Module: Algorithms II [M-INFO-107201]**Coordinators:** Prof. Dr. Peter Sanders**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
6 CP**Grading**
graded**Recurrence**
Each winter term**Duration**
1 term**Language**
English**Level**
4**Version**
1

Mandatory			
T-INFO-114225	Algorithms II	6 CP	Sanders

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

The student has an in-depth insight into the theoretical and practical aspects of algorithms and is able to identify and formally formulate algorithmic problems in various application areas. Furthermore, they know advanced algorithms and data structures from the areas of graph algorithms, algorithmic geometry, string matching, algebraic algorithms, combinatorial optimization, and external memory algorithms. They are able to independently understand algorithms they are unfamiliar with, associate them with the above areas, apply them, determine their running time, evaluate them, and select appropriate algorithms for given applications. Furthermore, the student is able to adapt existing algorithms to related problems. In addition to algorithms for concrete problems, the student knows advanced techniques of algorithmic design. This includes parameterized algorithms, approximation algorithms, online algorithms, randomized algorithms, parallel algorithms, linear programming, and algorithm engineering techniques. For given algorithms, the student is able to identify techniques used to better understand these algorithms. In addition, they are able to select appropriate techniques for a given problem and use them to design their own algorithms.

Content

This module is designed to provide students with the basic theoretical and practical aspects of algorithm design, analysis, and engineering. It teaches general methods for designing and analyzing algorithms for basic algorithmic problems, as well as the basic principles of general algorithmic methods such as approximation algorithms, linear programming, randomized algorithms, parallel algorithms, and parameterized algorithms.

Workload

Lecture with 3 semester hours + 1 semester hour exercise

6 ECTS correspond to about 180 hours

about 45h visiting the lectures

about 15h visiting the exercises

about 90h follow-up of lectures and solving the exercise sheets

about 30h preparation for the exam

M

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

Coordinators: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Operations Research\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German

Level
3

Version
9

Compulsory Elective Courses (Elective: 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 (Elective: 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 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

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 Supply 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

5.6 Module: Applied Informatics [M-WIWI-101430]

Coordinators: Prof. Dr. Andreas Oberweis
Prof. Dr. Melanie Volkamer

Organisation: KIT Department of Business and Economics

Part of: [Informatics \(mandatory\)](#)
[Informatics \(mandatory\)](#)

Credits
8 CPGrading
gradedRecurrence
Each termDuration
2 termsLanguage
GermanLevel
2Version
4

Mandatory			
T-WIWI-114156	Applied Informatics – Cybersecurity	4 CP	Volkamer
T-WIWI-110338	Applied Informatics – Modelling	4 CP	Fritsch, Oberweis

Assessment

A written examination in accordance with § 4(2), 1 SPO is offered for each of the two parts of the course. The examination lasts 60 minutes in each case.

The module grade consists of the average of the grades of the two performance assessments weighted with credit points.

Prerequisites

None.

Competence Goal

The student

- knows the common modeling languages for the description of application domains and early software system design aspects,
- has basic knowledge of computer science methods and systems for designing and implementing distributed information systems (and thus for supporting electronic business),
- selects, designs and implements these methods and systems appropriately,
- can explain and apply the basics of information security,
- knows suitable measures to achieve various protection goals and can implement these measures,
- can assess the quality of organizational protective measures, i.e. knows, among other things, what needs to be taken into account when implementing individual measures,
- understands the differences between information security in the company and in a private context,
- knows the areas of application of different standards and is aware of their weaknesses,
- knows the problems of information security that can arise from human-machine interaction and can explain them,
- can deal critically with reports of security problems found,
- can structure a software project in the field of information security and explain and present results in oral and written form and
- can apply the techniques of human-centered security and privacy by design to create user-friendly software.

Content

The course "**Applied Informatics - Modelling**" mainly addresses the early phases of the development of database-supported information systems, distributed systems for information services, intelligent systems and software systems in general. Main topics are modelling concepts and languages for describing application domains, as well as static and dynamic aspects of early software system design. The course addresses in detail the following approaches: Entity-Relationship model, advanced aspects of UML, description logic, relational model, Petri nets, and event-driven process chains.

The course "**Applied Informatics - Cyber Security**" provides insights into

- 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 (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

The total workload for this module is approx. 240 hours (8 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

Previous knowledge from the module *Basic Concepts of Informatics and Algorithms I* is strongly recommended.

M

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

Coordinators: Prof. Dr. Johannes Philipp Reiß
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Economics\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German

Level
3

Version
6

Compulsory Elective Courses (Elective: 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	Schienze
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

5.8 Module: Bachelor's Thesis [M-INFO-104875]**Organisation:** KIT Department of Informatics**Part of:** Bachelor's Thesis**Credits**
15 CP**Grading**
graded**Recurrence**
Each term**Duration**
1 term**Language**
German/English**Level**
3**Version**
1

Mandatory			
T-INFO-109907	Bachelor's Thesis	15 CP	

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 a written report which shows that the student can autonomously investigate a scientific problem in Information Engineering and Management. The work load for the Bachelor thesis should be 360h. The recommended project time is 4 months, the maximal project time is 5 months. The Bachelor thesis may also be written in English.

M

5.9 Module: Basic Notions of Computer Science [M-INFO-101170]

Coordinators: Dr. rer. nat. Torsten Ueckerdt
Dr. rer. nat. Mattias Ulbrich

Organisation: KIT Department of Informatics

Part of: [Informatics \(mandatory\)](#)
[Informatics \(mandatory\)](#)

Credits
6 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
German

Level
1

Version
1

Mandatory			
T-INFO-101965	Basic Notions of Computer Science Pass	0 CP	Ueckerdt, Ulbrich
T-INFO-101964	Basic Notions of Computer Science	6 CP	Ueckerdt, Ulbrich

Competence Goal

- Students know the most important techniques for definitions and are able to read and understand such definitions.
- Students know the difference between syntax and semantics.
- Students know the most important notions from discrete mathematics and computer science and are able to use them for the description of problems and in proofs.

Content

- informal notion of algorithm, basics of correctness proofs
- computational complexity measures, hard problems
- big O notation, master theorem
- alphabets, words, formal languages
- finite acceptors, contextfree grammars
- inductive/recursive definitions, proofs by induction, closure
- relations and functions
- graphs

Workload

180 h

M**5.10 Module: Basic Practical Course for the ICPC-Programming Contest [M-INFO-101230]****Coordinators:** TT-Prof. Dr. Thomas Bläsius**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
4 CP**Grading**
pass/fail**Recurrence**
Each summer term**Duration**
1 term**Language**
German**Level**
3**Version**
1

Mandatory			
T-INFO-101991	Basic Practical Course for the ICPC-Programming Contest	4 CP	Bläsius, Goetze, Ueckerdt, Zündorf

M

5.11 Module: Business Administration [M-WIWI-105267]

Coordinators: Prof. Dr. Marliese Uhrig-Homburg
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Business and Economics

Part of: [Economics and Management \(mandatory\)](#)

Credits
8 CP

Grading
graded

Recurrence
Each term

Duration
2 terms

Language
German

Level
2

Version
3

Mandatory			
T-WIWI-111632	Production and Logistics	3 CP	Fichtner, Nickel, Schultmann
Compulsory Elective Courses (Elective: 1 item)			
T-WIWI-111594	Management and Marketing	5 CP	Klarmann, Lindstädt, Nieken, Terzidis
T-WIWI-112820	Introduction to Finance and Accounting	5 CP	Luedecke, Ruckes, Wouters

Assessment

The assessments of the courses are written examinations.

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 should be able to

- deal with advanced topics in accounting,
- describe the impacts and features of marketing instruments,
- knows the problem formulation and theories of production management, including the areas of energy, construction, real-estate and ergonomics,
- evaluate information as a competitive factor and is in control of the terminology and the methods to assess information.

Content

The institutional framework and the modelling and formal description of a company's decisions play an essential role in this module. This module contains problems in procurement and materials management as well as in logistics. Modern production processes for goods and services are systematically presented. Marketing research and knowledge of the range of marketing instruments are fundamental for decisions in a competitive market environment. Advanced topics in accounting are also taught.

Workload

The total workload for this module is approximately 240 hours (8 credits). The distribution is done according to 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, 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.

M

5.12 Module: Business Processes and Information Systems [M-WIWI-101476]

Coordinators: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Business and Economics
Part of: [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German

Level
3

Version
7

Compulsory Elective Courses (Elective: between 1 and 2 items)			
T-WIWI-102697	Business Process Modelling	4,5 CP	Oberweis
T-WIWI-109799	Process Mining	4,5 CP	Schreiber
Supplementary Courses (Elective: between 0 and 1 items)			
T-WIWI-113957	Applied Informatics – Mobile Computing	4,5 CP	Schiefer
T-WIWI-110711	Supplement Applied Informatics	4,5 CP	Professorenschaft des Instituts AIFB
T-WIWI-110541	Advanced Lab Informatics (Bachelor)	4,5 CP	Professorenschaft des Instituts AIFB
T-WIWI-112915	Advanced Lab Realization of Innovative Services (Bachelor)	4,5 CP	Oberweis

Assessment

The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits and truncated after the first decimal.

Prerequisites

At least one of the courses "Business Process Modelling" or "Process Mining" has to be attended.

Competence Goal

Students

- design architecture models of enterprise information systems and compare alternative designs,
- explain the concepts and principles of process modeling languages and methods, apply the methods in a concrete situation and evaluate the results,
- choose an appropriate modeling language according to a given context for analysing, modeling and improving business processes.

Content

Modeling the relevant aspects of a business process is the basis for efficient and effective support of this process in an enterprise information system. Detailed knowledge of languages, methods and software tools for supporting business process modeling is taught in this module.

Additionally fundamentals of software quality management are considered in this module. Maturity models like CMMI or SPICE for evaluation and improvement of a software development process are introduced.

M

5.13 Module: Commercial Law [M-INFO-101191]

Coordinators: Dr. Yvonne Matz
Organisation: KIT Department of Informatics
Part of: Law (mandatory)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
3 terms

Language
German

Level
1

Version
3

Mandatory			
T-INFO-102013	Exercises in Civil Law	9 CP	Matz

Competence Goal

The student

- has in-depth knowledge of general and special law of obligations and property law,
- is able to understand the interaction of the legal regulations in the German Civil Code (BGB) (concerning the various types of contract and the associated liability issues, performance processing, performance disruptions, various types of transfer of ownership and security rights in rem) and in commercial and company law (in particular concerning the special features of commercial transactions, commercial representation and merchant law as well as the organizational forms provided by German company law for entrepreneurial activity),
- acquire the ability to solve legal problems methodically and accurately using legal means in the private law exercise.

Content

The module builds on the "Introduction to Private Law" module. Students will gain in-depth knowledge of special types of contracts under the German Civil Code (BGB) and more complex corporate law constructions. Furthermore, students are taught how to solve more complex legal issues in a methodically sound manner.

M

5.14 Module: Computer Architecture [M-INFO-100818]**Coordinators:** Prof. Dr. Wolfgang Karl**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
6 CP**Grading**
graded**Recurrence**
Each summer term**Duration**
1 term**Language**
German**Level**
3**Version**
1

Mandatory			
T-INFO-101355	Computer Architecture	6 CP	Karl

M

5.15 Module: Computer Graphics [M-INFO-100856]

Coordinators:

Prof. Dr.-Ing. Carsten Dachsbacher

Organisation:

KIT Department of Informatics

Part of:

Informatics (Compulsory Elective Modules in Informatics)

Informatics (Compulsory Elective Modules in Informatics)

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

Mandatory			
T-INFO-101393	Computer Graphics	6 CP	Dachsbacher

M

5.16 Module: Computer Organization [M-INFO-103179]**Coordinators:** Prof. Dr. Wolfgang Karl**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
6 CP**Grading**
graded**Recurrence**
Each winter term**Duration**
1 term**Language**
German**Level**
3**Version**
1

Mandatory			
T-INFO-103531	Computer Organization	6 CP	Karl

M

5.17 Module: Constitutional and Administrative Law [M-INFO-105247]

Coordinators: TT-Prof. Dr. Frederike Zufall
Organisation: KIT Department of Informatics
Part of: [Law \(mandatory\)](#) (Usage until 4/8/2026)

Credits
6 CP

Grading
graded

Recurrence
Each term

Duration
2 terms

Language
German

Level
2

Version
1

Mandatory			
T-INFO-110300	Public Law I & II	6 CP	Zufall

Workload

See German version.

M

5.18 Module: Database Systems [M-INFO-104921]

Coordinators: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: [Informatics \(mandatory\)](#)

Credits
4 CP

Grading
graded

Recurrence
Each summer term

Duration
1 term

Language
German

Level
2

Version
1

Mandatory			
T-INFO-101497	Database Systems	4 CP	Böhm

M**5.19 Module: Digital Circuits Design [M-INFO-102978]****Coordinators:** Prof. Dr.-Ing. Uwe Hanebeck**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
6 CP**Grading**
graded**Recurrence**
Each summer term**Duration**
1 term**Language**
German**Level**
3**Version**
1

Mandatory			
T-INFO-103469	Digital Circuits Design	6 CP	Hanebeck

M

5.20 Module: Digital Games [M-INFO-106291]

Coordinators: Prof. Dr. Kathrin Gerling

Organisation: KIT Department of Informatics

Part of: [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)

Credits
6 CP

Grading
graded

Recurrence
Each summer term

Duration
1 term

Language
German

Level
3

Version
1

Mandatory			
T-INFO-112750	Digital Games	6 CP	Gerling
T-INFO-112751	Digital Games Pass	0 CP	Gerling

M

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

Coordinators: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Business and Economics
Part of: Economics and Management (Business Administration)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German

Level
3

Version
12

Compulsory Elective Courses (Elective: 9 credits)			
T-WIWI-111307	Digital Services: Foundations	4,5 CP	Förster, 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 services.

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

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

Coordinators: Prof. Dr. Ingrid Ott
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Economics\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German/English

Level
3

Version
10

Mandatory			
T-WIWI-103213	Basic Principles of Economic Policy	4,5 CP	Ott
Compulsory Elective Courses (Elective: 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

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

Coordinators: Prof. Dr. Clemens Puppe
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Economics\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
2 terms

Language
German/English

Level
3

Version
5

Compulsory Elective Courses (Elective:)			
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 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

- 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 macroeconomic issues such as public debt 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

5.24 Module: Economics [M-WIWI-101431]

Coordinators: Prof. Dr. Clemens Puppe
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(mandatory\)](#)

Credits
5 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German

Level
1

Version
2

Mandatory			
T-WIWI-102708	Economics I: Microeconomics	5 CP	Puppe, Reiß

Assessment

The assessment of the module is a written examination according to §4(2), 1 of the examination regulation. The grade of the module corresponds to the grade of this examination.

The main exam takes place subsequent to the lectur. The re-examination is offered at the same examination period. 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

Competence Goal

It is the main aim of this module to provide basic knowledge in economic modelling. In particular, the student should be able to analyze market processes and the determinants of market results. Furthermore, she should be able to evaluate the effects of economic policy measures on market behavior and propose alternative, more effective policy measures.

In particular, the student should learn

- to apply simple microeconomic concepts,
- to analyze the structure of real world economic phenomena,
- to judge the possible effects of economic policy measures on the behavior of economic agents (in simple decision problems),
- to suggest alternative policy measures,
- to analyze as a participant of a tutorial simple economic problems by solving written exercises and to present the results of the exercises on the blackboard,
- to become familiar with the basic literature on microeconomics.

The student should gain basic knowledge in order to help in practical problems

- to analyze the structure of microeconomics relationships and to present own problem solutions,
- solve simple economic decision problems.

Content

In the two main parts of the course, problems of microeconomic decision making (household and firm behavior) and problems of commodity allocation on markets (market equilibria and their efficiency properties of markets) are discussed. In the final part of the course, basics of imperfect competition (oligopolistic markets) and of game theory as well as welfare economics are presented.

Additional Information

When personal resources are available students' tutorials will be established.

Workload

See German version.

M

5.25 Module: eFinance [M-WIWI-101402]

Coordinators: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Business and Economics
Part of: Economics and Management (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 (Elective: 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 adequately 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 addition 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 supplementary 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

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

Coordinators: Prof. Dr. Wolf Fichtner
Organisation: KIT Department of Business and Economics
Part of: Economics and Management (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 (Elective: 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 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 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

5.27 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: [Economics and Management \(Business Administration\)](#)

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

Compulsory Elective Courses (Elective:)			
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.

M**5.28 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: [Economics and Management \(Business Administration\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each summer term

Duration
1 term

Language
German

Level
3

Version
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 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

- 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

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

Coordinators: Prof. Dr. Maxim Ulrich
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Business Administration\)](#)

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

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

Coordinators: Prof. Dr. Maxim Ulrich
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Business Administration\)](#)

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

5.31 Module: Formal Systems [M-INFO-100799]**Coordinators:** Prof. Dr. Bernhard Beckert**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
6 CP**Grading**
graded**Recurrence**
Each winter term**Duration**
1 term**Language**
German**Level**
3**Version**
1

Mandatory			
T-INFO-101336	Formal Systems	6 CP	Beckert

M

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

Coordinators: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Business Administration\)](#)

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 (Elective: 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**5.33 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: [Economics and Management \(Business Administration\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
2 terms

Language
English

Level
3

Version
7

Compulsory Elective Courses (Elective: 9 credits)			
T-WIWI-111307	Digital Services: Foundations	4,5 CP	Förster, 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 pushes the 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.

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

M

5.34 Module: German and European Public Law [M-INFO-107555]

Coordinators: TT-Prof. Dr. Frederike Zufall
Organisation: KIT Department of Informatics
Part of: [Law \(mandatory\)](#) (Usage from 4/10/2026)

Credits
6 CP

Grading
graded

Recurrence
Each term

Duration
2 terms

Language
German

Level
2

Version
2

Mandatory			
T-INFO-110300	Public Law I & II	6 CP	Zufall

Workload

See German version.

M**5.35 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: Economics and Management (Business Administration)

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

Elective Offer (Elective:)			
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

5.36 Module: Human Computer Interaction [M-INFO-107166]**Coordinators:** Prof. Dr.-Ing. Michael Beigl**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
6 CP**Grading**
graded**Recurrence**
Each summer term**Duration**
1 term**Language**
English**Level**
4**Version**
1

Mandatory			
T-INFO-114192	Human-Computer-Interaction	6 CP	Beigl
T-INFO-114193	Human-Computer-Interaction Pass	0 CP	Beigl

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

After completing the course, students will be able to

- reproduce basic knowledge about the field of human-machine interaction
- name and apply basic techniques for analysing user interfaces
- apply basic rules and techniques for designing user interfaces
- analyse and evaluate existing user interfaces and their function

Content

Topics are:

1. human information processing (models, physiological and psychological principles, human senses, action processes),
2. design principles and design methods, input and output units for computers, embedded systems and mobile devices,
3. principles, guidelines and standards for the design of user interfaces
4. technical basics and examples for the design of user interfaces (text dialogues and forms, menu systems, graphical interfaces, interfaces in the WWW, audio dialogue systems, haptic interaction, gestures),
5. methods for modelling user interfaces (abstract description of interaction, embedding in requirements analysis and the software design process),
6. evaluation of systems for human-machine interaction (tools, evaluation methods, performance measurement, checklists).
7. practising the above basics using practical examples and developing independent, new and alternative user interfaces.

Workload

The total workload for this course unit is approx. 180 hours (6.0 credits).

Attendance time: Attendance of the lecture 15 x 90 min = 22 h 30 min

Attendance time: Attendance of the exercise 8 x 90 min = 12 h 00 min

Preparation / follow-up of the lecture 15 x 150 min = 37 h 30 min

Preparation / follow-up of the exercise 8 x 360min = 48h 00min

Go through slides/script 2x 2 x 12 h = 24 h 00 min

Prepare exam = 36 h 00 min

SUM = 180h 00 min

M

5.37 Module: Humanoid Robots - Seminar [M-INFO-107152]

Coordinators: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-114170	Humanoid Robots - Seminar	3 CP	Asfour

Assessment

See partial Achievements (Teilleistung)

Prerequisites

See partial Achievements (Teilleistung)

Competence Goal

The students choose a topic from the field of humanoid robotics, e.g. robot design, motion generation, perception or learning. They conduct a literature research on this topic under the guidance of a scientific supervisor. At the end of the semester, they present the results and write a term paper in English in the form of a scientific publication.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

The student gained experience with literature research on a current research topic. He/she explored, understood and compared different approaches to a selected scientific problem. The student is able to write a summary of their literature research in the form of a scientific publication in English and to give a scientific talk on it.

Workload

Seminar with 2 SWS, 3 LP
 3 LP corresponds to 90 hours, including
 45 hours literature research
 25 hours manuscript preparation
 10 hours preparation of the presentation
 10 hours attendance time

Recommendations

Attending the lectures Robotics I – Introduction to Robotics, Robotics II: Humanoid Robotics, Robotics III – Sensors and Perception in Robotics, Mechano-Informatics and Robotics and Wearable Robotic Technologies is recommended.

M

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

Coordinators: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Business Administration\)](#)

Credits
9 CPGrading
gradedRecurrence
Each termDuration
2 termsLanguage
German/EnglishLevel
3Version
4

Mandatory			
T-WIWI-102606	Fundamentals of Production Management	5,5 CP	Schultmann
Supplementary Courses (Elective: 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

5.39 Module: Informatics Seminar [M-INFO-106327]

Coordinators: Professorenschaft des Instituts AIFB

Organisation: KIT Department of Informatics
KIT Department of Business and Economics

Part of: [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)

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

Seminar Informatics (Elective: 1 item)			
T-INFO-112835	Seminar Informatics	3 CP	Abeck
T-WIWI-112836	Seminar in Informatics (Bachelor)	3 CP	Professorenschaft des Instituts AIFB

M

5.40 Module: Information Security [M-INFO-106015]

Coordinators: Prof. Dr. Hannes Hartenstein
Prof. Dr. Thorsten Strufe

Organisation: KIT Department of Informatics

Part of: [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)

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

Mandatory			
T-INFO-112195	Information Security	5 CP	Hartenstein, Strufe

M

5.41 Module: Information Security: Theory and Practice [M-WIWI-107688]

Coordinators: Prof. Dr. Hannes Hartenstein
Prof. Dr. Thorsten Strufe
Prof. Dr. Melanie Volkamer

Organisation: KIT Department of Business and Economics

Part of: Informatics (Compulsory Elective Modules in Informatics)
Informatics (Compulsory Elective Modules in Informatics)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
2 terms

Language
German

Level
3

Version
1

Mandatory			
T-INFO-112195	Information Security	5 CP	Hartenstein, Strufe
T-WIWI-108439	Advanced Lab Security, Usability and Society	4,5 CP	Volkamer

Assessment

The module examination is carried out in the form of partial examinations on the two partial performances of the module. The assessment of success is described for each partial performance.

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

Prerequisites

None

Competence Goal

T-INFO-112195 "Information Security":

The student:

- has knowledge of the fundamentals and basic concepts of cryptography and IT security
- has knowledge of threats, attacker models, protection goals and security services
- has an understanding of techniques and security primitives for achieving the protection goals (one-time pad and stream ciphers, pseudorandom, pseudorandom permutations, block ciphers and their modes of operation, public key encryption, hash functions, message authentication codes)
- has insight into scientific evaluation and analysis methods of IT security (game-based formalization of confidentiality and integrity, security notions, information-theoretical security vs. semantic security)
- knows the basics of security protocols (key exchange, authentication, network security: IPsec and TLS)
- has an insight into other IT security approaches (access control, reactive security and attack detection)
- has an understanding of data types, personal reference, legal and technical basics of data protection
- knows the basics of system security (spam and phishing, vulnerabilities in software and malware, security of web applications, usability to increase security)
- has an understanding of IT security management and its certifications (IT security lifecycle, BSI basic protection/common criteria)

T-WIWI-108439 "Advanced Lab Security, Usability and Society":

The student:

- can structure, design or carry out a software project or a user inside study in the field of information security and present the results in oral and written form.
- can apply the techniques of Human Centered Security and Privacy by Design to create user-friendly software.
- can apply the methods of Human Centered Security and Privacy by Design to design or conduct a user study.
- can work on questions in a methodical and structured way in preparation for the final thesis.

Content**T-INFO-112195 "Information Security":**

- Basic concepts, fundamentals and historical overview
- Mathematical basics (discrete probabilities, number theory) and methods of IT security
- Symmetric encryption, pseudorandomness
- Block ciphers and operation modes
- Integrity assurance techniques (hash functions, MACs, key exchange)
- Asymmetric encryption
- Authentication with authentication factors and access control
- System security (vulnerabilities)
- System security (malware)
- Network security basics (IPsec, HTTPS, TLS)
- Reactive security (attack detection)
- Security of web applications
- Right to data protection, technical data protection, anonymity on the web, data anonymization/publication control
- IT security management and summary

T-WIWI-108439 "Advanced Lab Security, Usability and Society":

In the advanced lab, students deal with practical and interdisciplinary topics from the field of IT security and privacy at the interface to society. In addition to the programming of data-saving apps, the development or implementation of user studies, for example, can also be possible tasks in this course. The lab can be credited towards the KASTEL certificate. Further information on the KASTEL certificate can be found on the SECUSO website: https://secuso.aifb.kit.edu/Studium_und_Lehre.php

Workload

The total workload for this module is approximately 270 hours.

M

5.42 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: Economics and Management (Business Administration)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
2 terms

Language
German/English

Level
4

Version
3

Compulsory Elective Courses (Elective: at least 1 item)			
T-WIWI-111307	Digital Services: Foundations	4,5 CP	Förster, 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 (Elective: 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.

M**5.43 Module: Information Systems I [M-WIWI-104820]**

Coordinators: Prof. Dr. Sebastian Abeck
 Prof. Dr. Alexander Mädche
 Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Business and Economics

Part of: [Information Systems](#)

Credits
4 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
German

Level
1

Version
1

Mandatory			
T-WIWI-109817	Information Systems 1	4 CP	Mädche, Pfeiffer

Assessment

The module examination takes place in the form of a written examination of 60 minutes according to § 4 Abs. 2 via the course "Business Information Systems 1". 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.

Competence Goal

The student

- understands information systems and infrastructures as a dynamic interaction of technical and non-technical elements in the generation and use of information,
- knows application areas of information systems and infrastructures in business and society, understands digital transformation as a socio-technical design process of (business) processes (internal digitisation) and products/services (external digitisation) in information systems and infrastructures,
- knows different types of information systems and infrastructures in business and society,
- knows the potential benefits of a targeted supply of information in business and society through the appropriate use of information systems and infrastructures.
- develops an understanding of the importance of interdisciplinary, systemic thinking and learns to work with students in a team

General qualifications:

- Teamwork: communication, organization
- Problem-solving competence for socially relevant problems

Content

In the lecture "Business Information Systems 1" of the module central basics of information systems are introduced as a scientific discipline. The subject area, basic terms, scientific character and goals as well as methods in science and practice of information systems are introduced. Concepts, methods and theories as well as systems and their engineering design are discussed along the levels of individual, organization and market. The lectures are complemented by exercises with real questions.

Workload

Total effort for 4 credit points: approx. 120 hours.

Presence time: 40 hours

Preparation / follow-up: 40 hours

Exam and exam preparation: 40 hours

M

5.44 Module: Information Systems II [M-WIWI-104821]

Coordinators: Prof. Dr. Alexander Mädche
 Prof. Dr. Jella Pfeiffer
 Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Business and Economics

Part of: [Information Systems](#)

Credits
4 CP

Grading
graded

Recurrence
Each summer term

Duration
1 term

Language
German

Level
1

Version
1

Mandatory			
T-WIWI-109818	Information Systems 2	4 CP	Pfeiffer

Assessment

The module examination takes place in the form of a written examination of 60 minutes according to § 4 Abs. 2 via the course Business Information Systems 2.

Competence Goal

Students

- know important integrated information systems and understand how they are being used in organisations.
- understand central concepts of IT management.
- learn the foundations of market engineering and understand how digital platforms contribute to the solution of allocation problems and how their success can be measured.
- know the foundations of digital value creation (information economy), and basic concepts for the evaluation and analysis of data.

Content

In the lecture Information Systems II of the module four central issues of Information Systems, respectively their relevance in companies and society, are deepened. This includes the management of IT systems in organizations (IT Management), the use of IT for corporate management (Integrated Information Systems), the use of digital platforms and markets to coordinate economic problems such as the allocation and exchange of goods and services (Platform Economics), and the value and use of data (i.a. big data, open data, etc.) (Information Economics).

Workload

Total effort for 4 credit points: approx. 120 hours.

Presence time: 40 hours

Preparation / follow-up: 40 hours

Exam and exam preparation: 40 hours

M

5.45 Module: Intellectual Property and Data Protection [M-INFO-101253]**Coordinators:** N.N.**Organisation:** KIT Department of Informatics**Part of:** [Law \(Compulsory Elective Module in Law\)](#)**Credits**
6 CP**Grading**
graded**Recurrence**
Each winter term**Duration**
1 term**Language**
German**Level**
3**Version**
3

Mandatory			
T-INFO-109840	Intellectual Property and Data Protection	6 CP	N.N.

Content

Building onto what the students have learned in law during the first two years of Bachelor studies, the module *Law* in the third Bachelor years has the purpose of both deepening and specialising the legal studies in areas of practical importance for information economics and management...

M

5.46 Module: Introduction in Computer Networks [M-INFO-103455]

Coordinators: Prof. Dr. Martina Zitterbart
Organisation: KIT Department of Informatics
Part of: [Informatics \(mandatory\)](#)

Credits
4 CP

Grading
graded

Recurrence
Each summer term

Duration
1 term

Language
German

Level
2

Version
1

Mandatory			
T-INFO-102015	Introduction in Computer Networks	4 CP	Zitterbart

M

5.47 Module: Introduction to Artificial Intelligence [M-INFO-106014]

Coordinators: Prof. Dr. Pascal Friederich
Prof. Dr. Gerhard Neumann

Organisation: KIT Department of Informatics

Part of: [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)

Credits
5 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
German

Level
3

Version
1

Mandatory			
T-INFO-112194	Introduction to Artificial Intelligence	5 CP	Friederich, Neumann

M

5.48 Module: Introduction to Civil Law [M-INFO-101190]

Coordinators: Dr. Yvonne Matz
Organisation: KIT Department of Informatics
Part of: [Law \(mandatory\)](#)

Credits
5 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
German

Level
1

Version
3

Mandatory			
T-INFO-103339	Civil Law for Beginners	5 CP	Matz

M

5.49 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: [Economics and Management \(mandatory\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each summer term

Duration
2 terms

Language
German

Level
1

Version
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.

M

5.50 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: [Mathematics](#)

Credits
10 CP

Grading
graded

Recurrence
Each term

Duration
2 terms

Language
German

Level
1

Version
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

Keine

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 important discrete and continuous distributions, covariance and correlation, limit distributions

C. Theory of estimation and testing: sufficiency of statistics, point estimation (optimality, ML-method), interval 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

In some cases, knowledge is required that is imparted within the mathematics module. The module should therefore only be attended if the course Mathematics I for [Information Engineering and Management](#) [01360] has been attended beforehand.

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

The lecture will be accompanied by an exercise, a tutorial and a computer internship, which are recommended.

M

5.51 Module: Lab Protocol Engineering [M-INFO-101247]

Coordinators:

Prof. Dr. Martina Zitterbart

Organisation:

KIT Department of Informatics

Part of:

Informatics (Compulsory Elective Modules in Informatics)

Informatics (Compulsory Elective Modules in Informatics)

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

Mandatory			
T-INFO-102066	Lab Protocol Engineering	4 CP	Zitterbart

M**5.52 Module: Lab: Working with Database Systems [M-INFO-101865]****Coordinators:** Prof. Dr.-Ing. Klemens Böhm**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
4 CP**Grading**
pass/fail**Recurrence**
Each winter term**Duration**
1 term**Language**
German**Level**
3**Version**
2

Mandatory			
T-INFO-103552	Lab: Working with Database Systems	4 CP	Böhm

M

5.53 Module: Leadership & Sustainable HR-Management [M-WIWI-106860]**Coordinators:** Prof. Dr. Petra Nieken**Organisation:** KIT Department of Business and Economics**Part of:** Economics and Management (Business Administration)**Credits**
9 CP**Grading**
graded**Recurrence**
Each term**Duration**
2 terms**Language**
German**Level**
3**Version**
4

Mandatory			
T-WIWI-113745	HR-Management 1: HR Strategies in the Age of AI	4,5 CP	Nieken
Elective Offer (Elective:)			
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

5.54 Module: Lego Mindstorms - Practical Course [M-INFO-102557]**Coordinators:** Prof. Dr.-Ing. Tamim Asfour**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
4 CP**Grading**
pass/fail**Recurrence**
Each winter term**Duration**
1 term**Language**
German**Level**
3**Version**
2

Mandatory			
T-INFO-107502	Practical Course: Lego Mindstorms	4 CP	Asfour

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

The participants are able to design and construct a robot with motors and sensors using the Lego Mindstorms kit. The students are familiar with programming the Lego EV3 components using the MicroPython programming language. They are able to understand and solve several key problems in mobile robotics, such as autonomous navigation, detection of landmarks and objects as well as obstacle avoidance. The students know how to efficiently and independently solve problems in a small group in a given time frame and are able to systematically document their work and results.

Content

In this practical course, teams of three students build and program a mobile robot using Lego Mindstorms and the MicroPython programming language. The robots are challenged to complete a versatile parkour including sections like the traversal of a maze, following a line, crossing a bridge or avoiding obstacle. After initial building of the robots, a section of the parkour will be set up each week and tackled by the robots, for which the students have to prepare their code beforehand. A final race of the robots on the entire parkour will be held at the end of the semester.

Workload

118h

Recommendations

Basic knowledge in Python is necessary for successful completion of this course.

M

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

Coordinators: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Business Administration\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
2 terms

Language
English

Level
3

Version
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.

M**5.56 Module: MARS-Based Internship [M-INFO-101245]****Coordinators:** Prof. Dr.-Ing. Carsten Dachsbacher**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
4 CP**Grading**
graded**Recurrence**
Each term**Duration**
1 term**Language**
German/English**Level**
3**Version**
1

Mandatory			
T-INFO-102053	MARS Basis Lab	4 CP	Dachsbacher

Workload

120 h

M**5.57 Module: Mathematics I [M-MATH-104914]**

Coordinators: Prof. Dr. Andreas Rieder
Prof. Dr. Christian Wieners

Organisation: KIT Department of Mathematics

Part of: [Mathematics](#)

Credits
8 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
German

Level
1

Version
3

Mandatory			
T-MATH-109942	Mathematics I for Information Systems - Exam	7 CP	Rieder, Weiß, Wieners
T-MATH-109943	Mathematics I for Information Systems - Exercise	1 CP	Rieder, Weiß, Wieners

Assessment

The assessment in this module consists of

1. a nongraded certificate (following §4(3) of the examination regulations), which is earned by successfully completing exercises during the exercise sessions of Mathematics I in the lecture hall, and
2. a written examination of 90 minutes on the lecture mathematics I following §4(2), 1 of the examination regulations (7 credits).

Prerequisites

None

Competence Goal

Mathematical models are an important part in economical sciences. Therefore, the students need a basic knowledge in mathematics. The aim is the instruction in a comprehension of basic methods in analysis and linear algebra.

The students learn

- to use simple concepts and structures in mathematics;
- to recognize the mathematical structure of practical applications and to solve in simple cases mathematical problems;
- to comprehend the mathematical structure of more complex applications;
- to understand the mathematical basics to develop mathematical models for applications in cooperation with experts;
- to explain as a group member in the tutorial elementary mathematical structures and to stimulate in the discussion of examples the success of the group;
- to be in time for the tutorial group and for the preparation of homeworks;
- to work with basic mathematical literature.

The provides the foundations for

- comprehending the mathematical structure of more complex applications;
- developing mathematical models for applications in cooperation with experts;
- constructing algorithmical solutions of mathematical models for applications in cooperation with experts.

Content

The lectures mathematics I and II give an overview in basic mathematical knowledge which is required to understand modern computer science and economical sciences. Part I consist of linear algebra including the basic algebraic structures, vector spaces and linear mappings. Many algebraic concepts are important for computer science. Part II consists of analysis including an introduction into the calculus of functions of one or several variables.

Module Grade Calculation

The grade of the module is the grade of the written examination.

Additional Information

None.

Workload

See German version.

M**5.58 Module: Mathematics II [M-MATH-104915]**

Coordinators: Prof. Dr. Andreas Rieder
Prof. Dr. Christian Wieners

Organisation: KIT Department of Mathematics

Part of: [Mathematics](#)

Credits
8 CP

Grading
graded

Recurrence
Each summer term

Duration
1 term

Language
German

Level
1

Version
3

Mandatory			
T-MATH-109944	Mathematics II for Information Systems - Exam	7 CP	Rieder, Weiß, Wieners
T-MATH-109945	Mathematics II for Information Systems - Exercise	1 CP	Rieder, Weiß, Wieners

Assessment

The assessment in this module consists of

1. a nongraded certificate (following §4(3) of the examination regulations), which is earned by successfully completing exercises during the exercise sessions of Mathematics II in the lecture hall, and
2. a written examination of 90 minutes on the lecture Mathematics II (following §4(2), 1 of the examination regulations).

Prerequisites

None

Competence Goal

Mathematical models are an important part in economical sciences. Therefore, the students need a basic knowledge in mathematics. The aim is the instruction in a comprehension of basic methods in analysis and linear algebra.

The students learn

- to use simple concepts and structures in mathematics;
- to recognize the mathematical structure of practical applications and to solve in simple cases mathematical problems;
- to comprehend the mathematical structure of more complex applications;
- to understand the mathematical basics to develop mathematical models for applications in cooperation with experts;
- to explain as a group member in the tutorial elementary mathematical structures and to stimulate in the discussion of examples the success of the group;
- to be in time for the tutorial group and for the preparation of homeworks;
- to work with basic mathematical literature.

The provides the foundations for

- comprehending the mathematical structure of more complex applications;
- developing mathematical models for applications in cooperation with experts;
- constructing algorithmical solutions of mathematical models for applications in cooperation with experts.

Content

The lectures mathematics I and II give an overview in basic mathematical knowledge which is required to understand modern computer science and economical sciences. Part I consist of linear algebra including the basic algebraic structures, vector spaces and linear mappings. Many algebraic concepts are important for computer science. Part II consists of analysis including an introduction into the calculus of functions of one or several variables.

Module Grade Calculation

The grade of the module is the grade of the written examination.

Workload

See German version.

M**5.59 Module: Mechano-Informatics and Robotics [M-INFO-100757]****Coordinators:** Prof. Dr.-Ing. Tamim Asfour**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)

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

Mandatory			
T-INFO-101294	Mechano-Informatics and Robotics	4 CP	Asfour

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students understand the basics of the synergistic integration of methods from mechatronics, computer science and artificial intelligence using the example of humanoid robotics. They are acquainted with the basic concepts and methods of machine learning, the description of robot movements and actions as well as artificial neural networks and their application in robotics.

In particular, they are able to apply basic methods to problems and know relevant tools. Using research-oriented examples from humanoid robotics, students have learned – in an interactive way – to think analytically and to proceed in a structured and goal-oriented way when analyzing, formalizing and solving tasks.

Content

The lecture addresses topics at the interface between robotics and artificial intelligence, which are illustrated and explained based on examples from current research in the area of humanoid robotics. The lecture introduces fundamental algorithms in robotics and machine learning as well as methods for describing dynamical systems and representing robot motions and actions. This includes an introduction to artificial neural networks, the description of dynamical systems in state space as well as the learning of movement primitives. The topics and content are illustrated by practical examples from humanoid robotics.

Workload

Lecture with 2 SWS, 4 CP.

4 LP corresponds to approx. 120 hours, of which

approx. 40 hours of lecture attendance,

approx. 30 hours of follow-up work on the lecture

approx. 50 hours exam preparation

RecommendationsAttendance at the *Basispraktikums Mobile Roboter* is recommended.

M

5.60 Module: Methodical Foundations of OR [M-WIWI-101936]

Coordinators: Prof. Dr. Oliver Stein
Organisation: KIT Department of Business and Economics
Part of: Economics and Management (Operations Research)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German

Level
3

Version
8

Compulsory Elective Courses (Elective: 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 (Elective: at most 1 item)			
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 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

At least one of the courses "Nonlinear Optimization I" and "Global Optimization I" 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 approximately 270 hours. For further information see German version.

M**5.61 Module: Microprocessors I [M-INFO-101183]****Coordinators:** Prof. Dr. Wolfgang Karl**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
3 CP**Grading**
graded**Recurrence**
Each summer term**Duration**
1 term**Language**
German**Level**
3**Version**
1

Mandatory			
T-INFO-101972	Microprocessors I	3 CP	Karl

M**5.62 Module: Mobile Computing and Internet of Things [M-INFO-101249]****Coordinators:** Prof. Dr.-Ing. Michael Beigl**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
5 CP**Grading**
graded**Recurrence**
Each winter term**Duration**
1 term**Language**
German**Level**
3**Version**
2

Mandatory			
T-INFO-102061	Mobile Computing and Internet of Things	2,5 CP	Beigl
T-INFO-113119	Mobile Computing and Internet of Things - Exercise	2,5 CP	Beigl

Prerequisites

None

M

5.63 Module: Mobile Robots – Practical Course [M-INFO-101184]**Coordinators:** Prof. Dr.-Ing. Tamim Asfour**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
4 CP**Grading**
pass/fail**Recurrence**
Each summer term**Duration**
1 term**Language**
German/English**Level**
3**Version**
3

Mandatory			
T-INFO-101992	Mobile Robots – Practical Course	4 CP	Asfour

Assessment

see partial achievements (Teilleistung)

Prerequisites

see partial achievements (Teilleistung)

Competence Goal

Students can understand circuit diagrams and can assemble, test and debug complex PCBs. They are familiar with programming microcontroller-based embedded systems using the C language and cross compilers. The student can use methods for controlling robotic sensors and actuators, can conduct experiments with robots and solve tasks in this context independently and in small groups.

Content

During the practical course, ARMURO robots are assembled. Each student receives the components for their own robot and assembles it independently under supervision before putting it into operation. At the beginning, theoretical basics on electronic components, safety instructions, and soldering exercises are taught. Thereafter, the step-by-step assembly of the robot, initial operation and system tests are performed. This is followed by weekly exercises introducing microcontroller programming in C and explaining how to set up the development environment. Building on this, sensors and motors are calibrated and controlled, and reactive behavior patterns such as line tracking or obstacle avoidance are implemented. In the final phase, modules are integrated, tested, and optimized. The practical course ends with a final race in which the robots must complete an obstacle course.

Module Grade Calculation

See partial achievements

Workload

Practical Course with 4 SWS, 4 CP.

4 CP corresponds to approx. 120 h, of which

approx. 15 * 4h = 60h attendance time

approx. 15 * 3h = 45h preparation and follow-up time

approx. 15h exam preparation and attendance of exam

Recommendations

Knowledge of the C programming language and computer engineering is strongly recommended.

M

5.64 Module: Motion in Human and Machine - Seminar [M-INFO-102555]

Coordinators: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each summer term

Duration
1 term

Language
English

Level
4

Version
3

Mandatory			
T-INFO-105140	Motion in Human and Machine - Seminar	3 CP	Asfour

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students understand methods for modeling, processing, and analyzing human motions. They can explain approaches for capturing biological motion and biomechanical simulation.

Students can describe methods for learning motion primitives from human demonstrations and understand how human motion is mapped to robots with different kinematics and dynamics. They can apply these methods in new contexts.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

This interdisciplinary block seminar addresses methods for modeling, generating, and controlling movements in human and robot systems. Students gain insight into this interdisciplinary field, learning fundamentals of capturing biological motion, biomechanical simulation, robotics, and machine learning.

The seminar begins with the generation of human movement as an effect of muscle contraction. It covers how observed movement patterns can be identified and categorized. Methods for learning movement primitives from human demonstrations are presented, including approaches for reproducing these patterns on humanoid robots. The seminar addresses the challenge of mapping human motion to robots with different kinematics and dynamics. Students learn how motion primitives enable transfer of human movements to robotic systems and their application to motion generation in humanoid robots.

Students work in small groups on collaborative projects that apply the learned methods. These projects allow students to deepen their understanding through practical application of the methods.

Additional Information

This interdisciplinary seminar is conducted in cooperation with the University of Stuttgart and the University of Tübingen.

Workload

Seminar with 3 SWS, 3 LP
 3 LP corresponds to 90 hours, including
 30 hours attendance time
 15 hours group work
 20 hours literature research
 20 hours manuscript preparation
 5 hours video creation

Recommendations

Programming experience in C++, Python or Matlab is recommended.

Attending the lectures Robotics I – Introduction to Robotics, Robotics II: Humanoid Robotics, Robotics III - Sensors and Perception in Robotics, Mechano-Informatics and Robotics and Wearable Robotic Technologies is recommended.

M**5.65 Module: Operating Systems [M-INFO-101177]****Coordinators:** Prof. Dr.-Ing. Frank Bellosa**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
6 CP**Grading**
graded**Recurrence**
Each winter term**Duration**
1 term**Language**
German**Level**
3**Version**
2

Mandatory			
T-INFO-101969	Operating Systems	6 CP	Bellosa

Competence Goal

The students describe the basic mechanisms and policies of operating systems. They show the flow of execution in the kernel components and trace the interaction via defined system interfaces.

The students use the system call interface to request operating system services. They design and implement small applications (utilities) using the system call interface.

Content

Students describe mechanisms, policies and control structures in the follow components of an operating system:

Process management

- Synchronization
- Memory management
- File system
- I/O management

Workload

180 h

Recommendations

.

M

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

Coordinators: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Operations Research\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German

Level
3

Version
5

Compulsory Elective Courses (Elective: 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 (Elective: 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 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

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**5.67 Module: Orientation Exam [M-WIWI-104843]**

Coordinators: Studiendekan der KIT-Fakultät für Informatik
Studiendekan des KIT-Studienganges

Organisation: KIT Department of Informatics
KIT Department of Business and Economics

Part of: [Orientation Exam](#)

Credits
0 CP

Grading
pass/fail

Recurrence
Each term

Duration
2 terms

Language
German

Level
3

Version
1

Mandatory			
T-INFO-101531	Programming	5 CP	Koziolek, Reussner
T-INFO-101967	Programming Pass	0 CP	Koziolek, Reussner
T-MATH-109943	Mathematics I for Information Systems - Exercise	1 CP	Rieder, Weiß, Wieners
T-MATH-109942	Mathematics I for Information Systems - Exam	7 CP	Rieder, Weiß, Wieners
T-WIWI-109817	Information Systems 1	4 CP	Mädche, Pfeiffer

Modeled Deadline

This module must be passed until the end of the **3. semester**.

Prerequisites

None

M**5.68 Module: Practical Course Computer Engineering: Hardware Design [M-INFO-101219]**

Coordinators: Prof. Dr.-Ing. Jörg Henkel
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)
 Informatics (Compulsory Elective Modules in Informatics)

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

Mandatory			
T-INFO-102011	Practical Course Computer Engineering: Hardware Design	4 CP	Alsharkawy, Demirdag, Nassar

Assessment

See Partial Achievements (Teilleistung).

Prerequisites

See Partial Achievements (Teilleistung).

Competence Goal

Students understand basic computer science methods in the field of hardware design and can apply them to simple examples. They can identify, structure, and independently solve hardware design problems. In addition, they are able to reproduce the solutions verbally and in writing and present the results to non-experts. Furthermore, they can effectively solve complex hardware design tasks within a team.

Learning Objectives:

Students can develop simple hardware circuits using hardware description language VHDL and implement them on FPGA-based development boards. They are able to use manufacturer-specific tools for this process. Through independent planning of a team-based final project, students gain the competence to apply learned methods to complex tasks. Consequently, they can analyze, plan, distribute tasks, and integrate them into a functioning circuit. In addition, they can prepare the results in a suitable way so that they can also communicate them to non-experts.

Content

- Familiarization with the hardware description language VHDL
- Introduction to various generic and manufacturer-specific design tools
- Introduction and basics of programmable logic devices (FPGAs)
- Circuit design and implementation
- Independent design of a hardware circuit in teamwork
- Project planning
- Implementation phase in a team
- Presentation of the results

Workload

Topic introductions: 6 x 3 SWS = 18 SWS

Exercise sheets: 2 x 3 x 4 SWS = 24 SWS

Final project:

- design/project plan 8 SWS
 - implementation phase 8 x 8 SWS = 64 SWS
 - project presentation: 1 x 10 SWS = 10 SWS
- = 124 SWS = 4 ECTS

M**5.69 Module: Practical Course Web Applications and Service-Oriented Architectures (I) [M-INFO-101633]****Coordinators:** Prof. Dr. Sebastian Abeck**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
5 CP**Grading**
graded**Recurrence**
Each winter term**Duration**
1 term**Language**
German**Level**
3**Version**
2

Mandatory			
T-INFO-103119	Practical Course Web Applications and Service-Oriented Architectures (I)	5 CP	Abeck

M**5.70 Module: Practical Course: Managing Scientific Data [M-INFO-106311]****Coordinators:** Prof. Dr.-Ing. Klemens Böhm**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
4 CP**Grading**
pass/fail**Recurrence**
Irregular**Duration**
1 term**Language**
German**Level**
3**Version**
1

Mandatory			
T-INFO-112809	Practical Course: Managing Scientific Data	4 CP	Böhm

M**5.71 Module: Programming [M-INFO-101174]**

Coordinators: Prof. Dr.-Ing. Anne Koziolk
Prof. Dr. Ralf Reussner

Organisation: KIT Department of Informatics

Part of: [Informatics \(mandatory\)](#)
[Informatics \(mandatory\)](#)

Credits
5 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
German

Level
1

Version
1

Mandatory			
T-INFO-101967	Programming Pass	0 CP	Koziolk, Reussner
T-INFO-101531	Programming	5 CP	Koziolk, Reussner

Competence Goal

Students should learn

- basic structures of the programming language Java and how to apply them; in particular control and simple data structures, object orientation and implementation of basic algorithms
- basics of programming methodology and the ability to autonomously write executable small to medium sized Java programs

Content

- objects and classes
- types, values and variables
- methods
- control structures
- recursion
- references, lists
- inheritance
- input and output
- exceptions
- programming methodology
- implementation of basic algorithms in Java (such as sorting algorithms)

Additional Information

Programmieren wird ab WS26/27 eine geänderte Prüfungsmodalität haben:

Die Prüfungsleistung anderer Art wird eine Abschlussaufgabe und eine schriftliche Arbeit in Präsenz beinhalten. Der Inhalt der LV bleibt größtenteils bestehen. **Die Prüfung wird letztmalig nach alter Modalität im SS 26 angeboten.** Als Übergangsregelung wird die schriftliche Arbeit im WS26/27 für Wiederholer nur Inhalte aus der Vorlesung aus dem WS25/26 enthalten.

1:1 anrechenbar, keine inhaltliche Änderungen

M

5.72 Module: Programming Paradigms [M-INFO-101179]

Coordinators: Prof. Dr. Sebastian Erdweg
Prof. Dr. Ralf Reussner

Organisation: KIT Department of Informatics

Part of: [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)

Credits
6 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
German

Level
3

Version
2

Mandatory			
T-INFO-101530	Programming Paradigms	6 CP	Erdweg, Reussner

M**5.73 Module: Public Finance [M-WIWI-101403]**

Coordinators: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Economics\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German

Level
3

Version
7

Compulsory Elective Courses (Elective: 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 offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

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

5.74 Module: Research Practical Course: Explainable Artificial Intelligence [M-INFO-106495]

Coordinators: TT-Prof. Dr. Rudolf Lioutikov
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
6 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-113114	Research Practical Course: Explainable Artificial Intelligence	6 CP	Lioutikov

Assessment

See partial achievements (Teilleistung).

Prerequisites

See partial achievements (Teilleistung).

Competence Goal

Students learn to understand and question complex scientific topics and to reproduce and verify published results. to reproduce and review published results. Students gain in-depth knowledge of interactive learning and experience with the use of novel learning methods.

Content

Each student will select a topic in the field of Explainable Artificial Intelligence and study and analyze it in the context of Robot Learning. The organizers will suggest topics but the students are welcome suggest relevant topics. The students will then implement and evaluate several algorithms corresponding to the chosen topic. The experimental evaluation will be documented in a report and presented to their peers.

It is highly recommended to take this research project in combination with the "Explainable Artificial Intelligence" Seminar, where the students get the chance to acquire the required background on the literature.

Additional Information

It is only possible to resign within two weeks after assignment of the topic.

Workload

Workload = 180h = 6 ECTS

- Attendance time: 15h

- Project work: 135h

- Write scientific report + prepare presentation: 30h

Recommendations

We recommend taking this Praktikum after attending the "Explainable Artificial Intelligence" lecture in the summer semester.

We highly recommend to take this research project in combination with the "Explainable Artificial Intelligence" seminar.

- Experience in Machine Learning is recommended, e.g. through prior coursework.
 - The Computer Science Department offers several great lectures e.g., "Maschinelles Lernen - Grundlagen und Algorithmen" and "Deep Learning"
- A good mathematical background will be beneficial
- Python experience is recommended
- We might use the PyTorch deep learning library In the exercises. Some prior knowledge in this is helpful but not necessary.

M**5.75 Module: Research Seminar in Selected Topics in Statistical Learning and Data Science [M-INFO-106813]**

Coordinators: Prof. Dr. Nadja Klein
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits	Grading	Recurrence	Duration	Language	Level	Version
3 CP	graded	Irregular	1 term	English	4	1

Mandatory			
T-INFO-113674	Research Seminar in Selected Topics in Statistical Learning and Data Science	3 CP	Klein

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

- **Report Writing Support:** Master students will receive guidance in developing and writing their reports, including assistance with literature review, research design, data analysis, and result interpretation.
- **Peer Feedback and Collaboration:** The seminar fosters collaboration and peer learning, with participants offering constructive criticism to improve research projects.

Content

The Research Seminar provides a platform for advanced Master students, to explore and delve into topics aligned with recent advances in statistical learning and data science.

It is designed for Master students in Computer Science, Mathematics, Econometrics, Techno-Mathematics, Business Informatics, or similar programs seeking to enhance their expertise in the fields of Bayesian statistics, uncertainty quantification, statistical learning and methods for big data.

The seminar aims to foster a collaborative and intellectually stimulating environment where participants can refine their research skills, exchange ideas, and receive feedback on their work.

Workload

90h

Recommendations

Certified knowledge in Bayesian methods, uncertainty quantification and statistical learning or related methods for big data

M

5.76 Module: Robotics I - Introduction to Robotics [M-INFO-107162]**Coordinators:** Prof. Dr.-Ing. Tamim Asfour**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
6 CP**Grading**
graded**Recurrence**
Each winter term**Duration**
1 term**Language**
English**Level**
4**Version**
1

Mandatory			
T-INFO-114190	Robotics I - Introduction to Robotics	6 CP	Asfour

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

The students are able to apply the presented concepts to simple and realistic tasks from robotics. This includes mastering and deriving the mathematical concepts relevant for robot modeling. Furthermore, the students master the kinematic and dynamic modeling of robot systems, as well as the modeling and design of simple controllers. The students know the algorithmic basics of motion and grasp planning and can apply these algorithms to problems in robotics. They know algorithms from the field of image processing and are able to apply them to problems in robotics. They are able to model and solve tasks as a symbolic planning problem. The students have knowledge about intuitive programming procedures for robots and know procedures for programming and learning by demonstration.

Content

The lecture provides an overview of the fundamentals of robotics using the examples of industrial robots, service robots and autonomous humanoid robots. An insight into all relevant topics is given. This includes methods and algorithms for robot modeling, control and motion planning, image processing and robot programming. First, mathematical basics and methods for kinematic and dynamic robot modeling, trajectory planning and control as well as algorithms for collision-free motion planning and grasp planning are covered. Subsequently, basics of image processing, intuitive robot programming especially by human demonstration and symbolic planning are presented.

In the exercise, the theoretical contents of the lecture are further illustrated with examples. Students deepen their knowledge of the methods and algorithms by independently working on problems and discussing them in the exercise. In particular, students can gain practical programming experience with tools and software libraries commonly used in robotics.

Workload

Lecture with 3 SWS + 1 SWS Tutorial, 6 LP

6 LP corresponds to 180 hours, including

15 * 3 = 45 hours attendance time (lecture)

15 * 1 = 15 hours attendance time (tutorial)

15 * 6 = 90 hours self-study and exercise sheets

30 hours preparation for the exam

M

5.77 Module: Semantic Knowledge Management [M-WIWI-101438]**Coordinators:** Dr.-Ing. Tobias Käfer**Organisation:** KIT Department of Business and Economics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
9 CP**Grading**
graded**Recurrence**
Each term**Duration**
1 term**Language**
German/English**Level**
3**Version**
10

Mandatory			
T-WIWI-110848	Semantic Web Technologies	4,5 CP	Käfer
Supplementary Courses (Elective: at least 1 item)			
T-WIWI-110340	Applied Informatics – Applications of Artificial Intelligence	4,5 CP	Käfer
T-WIWI-102697	Business Process Modelling	4,5 CP	Oberweis
T-WIWI-110541	Advanced Lab Informatics (Bachelor)	4,5 CP	Professorenschaft des Instituts AIFB

Assessment

The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits and truncated after the first decimal.

Prerequisites

Lecture *Semantic Web Technologien* [2511310] is mandatory.

Competence Goal

Students

- know the motives for the application of knowledge management in organizations
- know the basic design dimensions of holistic knowledge management (organization, human, information technology, corporate culture)
- know the main group of IT systems for knowledge management and are able to describe the relevant application scenarios and basic operating modes of these systems
- know how to use the different IT systems for knowledge management in practice
- know the basic standards for the modeling of information and processes and are able to describe their formal structures
- know how to apply the different modeling languages
- know criteria to evaluate the success of knowledge management systems and are able to apply them to assess defined knowledge management scenarios

Content

In modern companies the availability and usability of knowledge is an essential factor of success for central managerial tasks and duties such as the improvement of business processes, product innovation and the amelioration of customer satisfaction.

This module illustrates the typical problems of knowledge management in organizations and presents IT methods to approach these questions. The relevant groups of knowledge management systems are analyzed and expanded in the subject areas knowledge representation/semantic modeling and document management/groupware systems.

Additional Information

Detailed information on the recognition of examinations in the field of Informatics can be found at <http://www.aifb.kit.edu/web/Auslandsaufenthalt>.

Workload

The workload is app. 270 hours.

M

5.78 Module: Seminar Decentralized Systems and Network Services [M-INFO-103048]**Coordinators:** Prof. Dr. Hannes Hartenstein**Organisation:** KIT Department of Informatics**Part of:** [Seminars](#)**Credits**
3 CP**Grading**
graded**Recurrence**
Irregular**Duration**
1 term**Language**
German**Level**
4**Version**
1

Mandatory			
T-INFO-106064	Seminar Decentralized Systems and Network Services	3 CP	Hartenstein



5.79 Module: Seminar Dependable Computing [M-INFO-102662]

Coordinators: Prof. Dr. Mehdi Baradaran Tahoori

Organisation: KIT Department of Informatics

Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-105577	Seminar Dependable Computing	3 CP	Tahoori

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

The objective of this seminar is to become familiar with general and state of the art techniques used in design and analysis of fault-tolerant digital systems.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

Reliability plays a major role in design of contemporary and next generation electronics. In many safety-critical application domains, reliability is considered as the main design criteria. With nanoscale technologies, the reliability of individual devices is decreasing, therefore, reliable computing must be considered in the design flow in order to ensure correctness of computing.

The objective of this seminar is to become familiar with general and state of the art techniques used in design and analysis of fault-tolerant digital systems. This seminar overviews reliable (fault-tolerant) computing and the design and evaluation of dependable systems, and provides a base for research in reliable systems.

The topics include study and investigation of existing and classical fault-tolerant systems as well as current trend in the research of reliable computing. Since reliability spans from hardware to software, and from device-level to system-level, various topics can be envisioned in the scope of this seminar and the prospective students can choose specific topic from a wide range of areas based on their interests and background.

Workload

4 SWS / 3CP = 90h/week

Recommendations

Knowledge of "Fault Tolerant Computing" and Computer Architecture is helpful.

M

5.80 Module: Seminar Image Analysis and Fusion [M-INFO-102375]

Coordinators: Prof. Dr.-Ing. Jürgen Beyerer
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each summer term

Duration
1 term

Language
German

Level
4

Version
1

Mandatory			
T-INFO-104743	Seminar Image Analysis and Fusion	3 CP	Beyerer

M

5.81 Module: Seminar in Privacy [M-INFO-107242]

Coordinators: Prof. Dr. Thorsten Strufe
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
4 CP

Grading
graded

Recurrence
Each summer term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-114268	Seminar in Privacy	4 CP	Strufe

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

The seminar deals with current topics from the research field of technical data protection.

These include, for example:

- Attacks on private information in behavioral data
- Anonymous communication
- Publication of anonymized usage data (semantic/syntactic privacy)
- Understanding and supporting the use of online media
- Security in networks

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

The student is able to

- carry out a literature search based on a given topic, identify and evaluate the relevant literature;
- independently compile research results from IT security and technical data protection;
- analyze and discuss scientific studies and place them in their context;
- carry out their own classifications and evaluations of scientific studies, report on them in writing and present the results in a short scientific presentation.

Workload

Workload attendance time in the seminar: 10h

Research and preparation of a paper: 75h

Reviewing and commenting on the preliminary papers of fellow students: 5h

Preparing the presentation: 30h

Recommendations

Fundamentals of IT security, computer networks and distributed systems are required

M

5.82 Module: Seminar Module Applied Informatics [M-WIWI-107691]

Coordinators: Professorenschaft des Instituts AIFB
Organisation: KIT Department of Informatics
 KIT Department of Business and Economics
Part of: [Seminars](#)

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

Mandatory			
T-WIWI-103485	Seminar in Informatics (Bachelor)	3 CP	Professorenschaft des Instituts AIFB

Assessment

The module examination is carried out by providing evidence of a seminar worth 3 credit points as a different type of examination (in accordance with §4(2), 3 SPO). The assessment of success is described in the corresponding course of this module.

Prerequisites

None

Competence Goal

The student

- deals with a defined problem in the field of applied informatics,
- analyzes and discusses problems within the framework of the courses and in the final seminar papers,
- discusses, presents and defends subject-specific arguments within a given task,
- organizes the preparation of the final seminar papers largely independently.
- Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and actively apply these guidelines in the preparation of their scientific work.

The skills acquired in the seminar module serve in particular as preparation for the Bachelor's thesis. Accompanied by the relevant examiners, students practise independent academic work when writing and presenting their final seminar papers.

Content

The module consists of a seminar that deals scientifically with topics of applied informatics.

The DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" is taught as part of the [online course "Good Scientific Practice"](#) of the KIT library, which can be completed in self-study.

Workload

The total workload for this seminar is approximately 90 hours. This is composed of the following:

1. Attendance Time (approx. 30 hours):

- Regular participation in seminar sessions (presentations, discussions, peer-review sessions).
- Introductory session and, if applicable, supplementary workshop units.

2. Self-Study (approx. 60 hours):

- **Literature research and induction (approx. 20 hours):** Searching for relevant specialist literature and exploring the specific topic area.
- **Preparation of the seminar performance (approx. 30 hours):** Writing the seminar paper or preparing the presentation materials.
- **Presentation preparation (approx. 10 hours):** Didactic preparation of the topic and practicing the presentation.

Teaching and Learning Methods

Seminar

M

5.83 Module: Seminar Module Economic Sciences [M-WIWI-101826]

Coordinators: Studiendekan des KIT-Studienganges
Organisation: KIT Department of Business and Economics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German

Level
3

Version
1

Compulsory Elective Courses (Elective: 1 item)

T-WIWI-103486	Seminar in Business Administration (Bachelor)	3 CP	Professorenschaft des Fachbereichs Betriebswirtschaftslehre
T-WIWI-103488	Seminar in Operations Research (Bachelor)	3 CP	Nickel, Rebennack, Stein
T-WIWI-103489	Seminar in Statistics (Bachelor)	3 CP	Grothe, Schienle
T-WIWI-103487	Seminar in Economics (Bachelor)	3 CP	Professorenschaft des Fachbereichs Volkswirtschaftslehre

Assessment

The assessment is done by a seminar with at least 3 CP.

The assessment of the seminar (following §4(2), 3 ER) is described at the course description.

Prerequisites

None.

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

The module M-WIWI-101826 focuses on a seminar that is thematically aligned with **economics**. Students will have the opportunity to engage in in-depth discussions and analyses relevant to current economic issues.

The competencies acquired within this seminar module are particularly designed to prepare students for their Bachelor's thesis. Under the guidance of the respective examiners, students will practice independent scientific work by writing and presenting their final seminar papers.

Attending the seminar sessions also integratively teaches key transferable skills alongside scientific working methods.

In addition to the seminar, the module emphasizes the importance of adhering to high standards of research ethics. As part of this commitment, students are required to familiarize themselves with the **DFG Code "Guidelines for Safeguarding Good Research Practice."** This training is offered through the [online course "Good Scientific Practice"](#) provided by the KIT Library, which can be completed through self-study at the student's convenience.

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 approximately 90 hours.

M

5.84 Module: Seminar Module Law [M-INFO-101218]

Coordinators: Dr. Yvonne Matz
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German

Level
3

Version
2

Mandatory			
T-INFO-115024	Seminar: Legal Studies Bachelor	3 CP	Professorenschaft des Fachbereichs Recht

Competence Goal

The student

- deals with a defined problem in the field of law,
- analyzes and discusses problems within the framework of the courses and in the final seminar papers,
- discusses, presents and defends subject-specific arguments within a given task,
- organizes the preparation of the final seminar papers largely independently.

The skills acquired in the seminar module serve in particular as preparation for the Bachelor's thesis. Accompanied by the relevant examiners, the student practises independent scientific work when writing the final seminar papers and presenting them.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines when writing their scientific work.

Content

The module consists of a seminar that is thematically related to law. A list of approved courses will be published on the Internet.

M**5.85 Module: Seminar: Designing and Conducting Experimental Studies [M-INFO-103078]**

Coordinators: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
4 CP

Grading
graded

Recurrence
Irregular

Duration
1 term

Language
German

Level
4

Version
1

Mandatory			
T-INFO-106112	Seminar: Designing and Conducting Experimental Studies	4 CP	Beigl

M

5.86 Module: Seminar: Advanced Algorithms in Computer Graphics [M-INFO-102729]**Coordinators:** Prof. Dr.-Ing. Carsten Dachsbacher**Organisation:** KIT Department of Informatics**Part of:** [Seminars](#)**Credits**
3 CP**Grading**
graded**Recurrence**
Each winter term**Duration**
1 term**Language**
German**Level**
4**Version**
1

Mandatory			
T-INFO-105664	Seminar: Advanced Algorithms in Computer Graphics	3 CP	Dachsbacher

M**5.87 Module: Seminar: Advanced Topics in Natural Language Processing [M-INFO-107353]**

Coordinators: Prof. Dr. Jan Niehues
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

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

Mandatory			
T-INFO-114433	Seminar: Advanced Topics in Natural Language Processing	3 CP	Niehues

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students learn to familiarise themselves independently with topics based on scientific literature and prepare them for presentations.

From the other presentations, students gain in-depth knowledge in sub-areas of machine translation and learn to critically analyse the work presented.

Content

Machine translation now makes it possible to automatically translate both written texts and spoken language into another language. In statistical approaches to machine translation, methods from machine learning are primarily used to train statistical models for the translation process.

In the seminar, current research results on various aspects of the systems will be discussed. Selected publications from the fields will be presented by the participants. Possible topics include improvement of word order and grammar of the target language, adaptation to topic or genre, treatment of spoken language phenomena, error correction, ...

Students are familiar with the DFG Code of Good Scientific Practice and successfully apply these guidelines when writing their scientific work.

Workload

90h

Recommendations

Previous knowledge from the lecture "Machine Translation" is an advantage.

M

5.88 Module: Seminar: Advanced Topics on SAT Solving [M-INFO-107209]

Coordinators: Prof. Dr. Peter Sanders
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory

T-INFO-114231	Seminar: Advanced Topics on SAT Solving	3 CP	Iser, Sanders
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Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

With selected high-influence papers from the field of SAT solving, we take a close look at how SAT solvers evolved in the past decade and learn about the major cornerstones of modern and efficient large scale SAT solving systems.

Workload

Attendance time (3-4 dates): 4.5 - 6h
 Reading, summarising and relating (2-3 papers): 30 - 40h
 Preparation of the presentation: 16 - 24h
 Total 90h

Recommendations

Knowledge of the basics from "SAT Solving in Practice" is helpful.

M

5.89 Module: Seminar: AI Systems Engineering [M-INFO-106356]

Coordinators: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
4 CP

Grading
graded

Recurrence
Irregular

Duration
1 term

Language
German/English

Level
4

Version
1

Mandatory			
T-INFO-112881	Seminar: AI Systems Engineering	4 CP	Beigl



5.90 Module: Seminar: Algorithm Engineering [M-INFO-106086]

Coordinators: Prof. Dr. Peter Sanders
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits	Grading	Recurrence	Duration	Language	Level	Version
4 CP	graded	Irregular	1 term	English	4	1

Mandatory			
T-INFO-112312	Seminar: Algorithm Engineering	4 CP	Sanders

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students can

- carry out a literature search based on a given topic, identify, locate, evaluate and finally analyse the relevant literature.
- prepare presentations in a scientific context. To this end, students master techniques that enable them to prepare and present the content to be presented to the audience.
- prepare their written seminar paper (as required later for further academic work) in accordance with the requirements and quality standards of academic writing, taking into account the format requirements specified by academic publishers for the publication of documents.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

This seminar covers various topics from the field of algorithm engineering. The focus can be on scalability, parallelism, efficiency or theoretical guarantees of algorithms. Example topics may include graph algorithms, sorting algorithms, string algorithms, SAT solvers, data structures or other algorithms. The exact focus of the seminar for the current semester will be announced in advance on the institute website by the chair of Prof. Sanders.

Participants in the seminar carry out their own literature research, present their results to their fellow students and prepare a paper.

The exact formalities will be announced at a kick-off event at the beginning of the semester, which will also be announced on the institute's website.

Workload

4 LP corresponds to approx. 120 working hours, of which

- 10h seminar attendance
- 45h Literature research, assessment and evaluation of relevant literature
- 25h preparation of own presentation
- 25h Preparation of the written paper
- 15h preparation and follow-up work

Recommendations

Knowledge of algorithms is an advantage. Exemplary lectures are Algorithms I, Algorithms II, Algorithm Engineering and Parallel Algorithms.

M

5.91 Module: Seminar: Artificial Intelligence for Energy Systems [M-INFO-106490]

Coordinators: TT-Prof. Dr. Benjamin Schäfer
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
4 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-113110	Seminar: Artificial Intelligence for Energy Systems	4 CP	Schäfer

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

- Students obtained a foundational knowledge of AI in energy systems as an active research field and can name some ongoing challenges
- Students are able to independently conduct a literature review on a given topic.
- Students are able to present their knowledge in a written and structured report
- Students are able to orally present results and discuss topics of the seminar in the broader context of the field

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

Artificial Intelligence (AI) is a key technology in many areas of society and research. Energy systems with the ongoing energy transition ("Energiewende") make it a fascinating field for deploying AI methods. AI and machine learning algorithms can play a crucial role in improving energy efficiency, optimizing power generation and distribution or enhancing system stability while facilitating additional renewable energy integration. This seminar will explore fundamental AI algorithms and their applications in energy systems. Examples may include forecasting of energy demand or renewable generation, explainability of algorithms as well as optimization via AI.

Workload

20h attendance time (kick-off and talks by other students)

20h literature review

40h writing of own contribution

10h per-review for other students

30h preparation of the final presentation

120h=4ECTS

Recommendations

Previous participation in "Energieinformatik 1" and/or "Energieinformatik 2" is beneficiary but not mandatory.

M

5.92 Module: Seminar: Computer Science TECO [M-INFO-105328]

Coordinators: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Irregular

Duration
1 term

Language
German/English

Level
4

Version
1

Mandatory			
T-INFO-110808	Seminar: Computer Science TECO	3 CP	Beigl

Workload

The total workload for this course unit is approx. 90 hours (3.0 credits).

Presence time: Kickoff, presentation and discussion and meeting with supervisors :
10 h 00 min

Literature research, study planning, implementation, analysis and documentation :
76 h 00 min

Preparation of the presentation :
4 h 00 min

SUM : 90 h 00 min

M

5.93 Module: Seminar: Critical Topics in AI [M-INFO-106958]

Coordinators: Prof. Dr. Pascal Friederich
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits	Grading	Recurrence	Duration	Language	Level	Version
3 CP	graded	Each summer term	1 term	English	4	1

Mandatory			
T-INFO-113915	Seminar: Critical Topics in AI	3 CP	Friederich

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Qualification objectives:

- Students are able to work independently on literature about a topic of current research and to critically evaluate it, to find and understand relevant publications, and to classify and process their content accordingly in order to be able to present the chosen topic area in the form of a presentation and a written paper.

Learning Objectives 

- Overview of positive as well as negative impact of AI technology
- Overview of scientific and related ethical issues in current AI research

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

This seminar covers the technical as well as ethical aspects of critical issues in AI. Topics covered include bias in machine learning methods, ethically and socially critical applications of AI, and the impact of AI on society. The exact topics will be determined in each semester.

Students will work independently on an advanced topic and critically engage with it, presenting and discussing their findings in a lecture and summarizing them in a seminar paper.

Workload

Total 90 h, of which:

- Introductory courses: 4 h
- Literature research: 30 h
- Writing the report (10-15 pages) and preparing the presentation (30+15 minutes): 50 h
- Presentation of the results: 6 h

Recommendations

Interest in social topics and research questions is required

M

5.94 Module: Seminar: Deep Learning for Robotics [M-INFO-107175]

Coordinators: Prof. Dr. Gerhard Neumann
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-114204	Seminar: Deep Learning for Robotics	3 CP	Neumann

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students are able to independently understand a complex research topic, present the content in a concise and understandable way and prepare a scientific report summarizing the topic. 

Students are able to independently understand a complex research topic, present the content in a concise and understandable way and prepare a scientific report summarizing the topic. Students get a deeper understanding of state-of-the art learning algorithms and get to know current research challenges.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

Each student has to choose one of the offered topics from the area of deep learning / robot learning / deep reinforcement learning / deep imitation learning. Each topic consists of several research papers for which the students have to prepare a presentation as well as a report in form of a scientific research paper. It is recommended to take the seminar together with the "Research Project Deep Learning for Robotics", where the presented algorithms will be implemented and evaluated. Students will work in teams of 2.

Workload

Workload = 90 h = 3 ECTS

Attendance time: 15h

Self-study: 45h

Writing a scientific report: 20h

Prepare presentation: 10h

Recommendations

Attendance of the lecture "Machine Learning - Fundamentals and Algorithms" is recommended.

M

5.95 Module: Seminar: Embedded Systems I [M-INFO-107231]

Coordinators: Prof. Dr.-Ing. Jörg Henkel
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
English

Level
4

Version
2

Mandatory			
T-INFO-114255	Seminar: Embedded Systems I	3 CP	Henkel

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students learn the basics of scientific work in the form of literature research, writing a scientific paper and giving a presentation to a specialist audience.

Learning objectives:

Students learn to read conference papers, articles in specialist journals and standard literature. Furthermore, they interpret these texts in order to give an overview of the topic in their own words in a paper. Finally, they also present an overview of the topic to other computer scientists. In doing so, they are trained in scientific writing in the form of expression, text structure and reduction to the essentials.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines when writing their scientific work.

Content

This module bundles the seminars at the Chair of Embedded Systems:

Internet of Things

Machine Learning

Embedded Security and Architectures

For current information, please check the course catalog and the Chair of Embedded Systems homepage at <https://ces.itec.kit.edu>.

Workload

90 h



5.96 Module: Seminar: Embedded Systems II [M-INFO-107232]

Coordinators: Prof. Dr.-Ing. Jörg Henkel
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-114256	Seminar: Embedded Systems II	3 CP	Henkel

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Qualification objective: Students learn the basics of scientific work in the form of literature research, writing a scientific paper and giving a presentation to a specialist audience.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines when writing their scientific work.

Learning objectives: Students learn how to read conference papers, articles in specialist journals and standard literature. Furthermore, they interpret these texts in order to give an overview of the topic in their own words in a paper. Finally, they also present an overview of the topic to other computer scientists. In doing so, they are trained in scientific writing in the form of expression, text structure and reduction to the essentials.

Content

This module bundles the seminars at the Chair of Embedded Systems:

Internet of Things (IoT) for Healthcare

Internet of Things (IoT) in Embedded Systems

Approximate Computing

Thermal-aware Embedded Systems

Dependability in Internet of Things (IoT)

Performance Optimization for Multicore Chips

Power Efficient Reliability

Distributed Decision Making

Low Power Design for Embedded Systems

Reconfigurable Embedded Systems

Mixed Criticality Systems

Security in Internet of Things (IoT)

For current information, please refer to the course catalog and the Chair of Embedded Systems homepage at <http://ces.itec.kit.edu>.

Additional Information

This is identical to the module 'Seminars: Embedded Systems I' and enables participation in a second seminar at the CES Chair.

Workload

90 h



5.97 Module: Seminar: Energy Informatics [M-INFO-103153]

Coordinators: Prof. Dr. Veit Hagenmeyer
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits	Grading	Recurrence	Duration	Language	Level	Version
4 CP	graded	Irregular	1 term	German/English	4	1

Mandatory			
T-INFO-106270	Seminar: Energy Informatics	4 CP	Hagenmeyer

Assessment

See Partial Achievements (Teilleistung).

Prerequisites

See Partial Achievements (Teilleistung).

Competence Goal

The student has an in-depth insight into the subject areas of energy informatics and has basic knowledge in the areas of modeling, simulation and algorithms in energy networks. Based on a given topic, he/she can identify, locate, evaluate and finally analyze relevant literature with the help of a literature search. He/she is able to classify the topic in the subject area and put it into an overall context.

He/she is able to write a seminar paper (and later the Bachelor's/Master's thesis) with a minimum of training, taking into account the format requirements specified by all publishers for the publication of documents. In addition, he/she knows how to elaborate the given topic in the form of a scientific presentation and knows techniques for preparing and presenting the content to be presented in a manner suitable for an audience. Thus, he/she has the knowledge to present scientific results of the research in written form as it is the case in scientific publications.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and apply these guidelines successfully in the preparation of their scientific work.

Content

Energy informatics is a young field of research that includes various areas outside of computer science, such as economics, electrical engineering and law. As a result of the energy transition, more and more electricity is being fed into the grid from renewable sources. However, the trend towards decentralized and volatile power generation is already leading to bottlenecks in power grids, as these are not designed for a bidirectional scenario. With the help of energy informatics and the associated networking of the various competencies, intelligent control of the grid infrastructure - of electricity consumers, generators, storage systems and grid components - should contribute to an environmentally friendly, sustainable, efficient and reliable energy supply.

For this reason, the seminar "Seminar: Energy Informatics" will examine different algorithms, simulations and modeling with regard to their advantages and disadvantages in the various areas of grid infrastructure.

As a rule, the prerequisite for passing the module is the preparation of a written paper of max. 15 pages and an oral presentation of at least 30 minutes.

Workload

4 LP corresponds to approx. 120 hours

- approx. 21 hours attendance of the seminar,
- approx. 45 hours analyzing and working on the topic,
- approx. 27 hours preparing and writing the presentation, and
- approx. 27 hours writing the paper.

M

5.98 Module: Seminar: Exoskeletons & Motion Capture [M-INFO-106927]

Coordinators: Prof. Dr. Katja Mombaur
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-113892	Seminar: Exoskeletons & Motion Capture	3 CP	Mombaur

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

- The students know the state of the art of exoskeletons and assistive robots and current medical applications.
- Students are familiar with the most important methods and devices for measuring human movements with and without robotic mobility assistance systems
- Students are able to independently research, understand, critically evaluate and summarize scientific literature on a given topic (usually in English).
- Students will be able to prepare and deliver a scientific presentation, taking into account the level of knowledge of the other seminar participants, and to answer detailed questions on the topic
- Students will be able to ask questions about scientific presentations of other students and make active contributions to scientific discussions
- Students will be able to use Latex to create a scientific text (in English) incorporating the sources they have read.

Content

This seminar provides an insight into the current state of research and the practical use of exoskeletons in medicine and their potential to improve the quality of life of people with and without physical disabilities. It also gives an overview of different motion capture technologies, which play an important role in exoskeleton research but have many other applications. The proseminar is offered by the research group Optimization and Biomechanics for Human-Centred Robotics at the IAR.

Exoskeletons are used to improve mobility and are worn by people directly on the body to support or completely replace their muscle strength. One class of exoskeletons assists people with mobility impairments to walk, stand and perform other physical activities so that they can regain their independence and participate in the activities of daily living. Other types of exoskeletons are used by healthy people to prevent injuries in difficult working conditions.

The applications of motion capture include many disciplines in which human behavior and movements are of interest, such as sports science, biomechanics, medicine, psychology, etc., but they also play an important role in the creation of animated films and computer games. In robotics, and especially in the development of exoskeletons, they are important for analyzing human-robot interaction and improving robot design and control. Various motion capture technologies exist for recording movement kinematics, ground reaction forces and muscle activity.

The proseminar presentation topics cover the spectrum of different exoskeleton types and motion capture technologies.

Schedule of the proseminar:

In an event in the first week of the semester, the topic of the seminar and the individual lecture topics are presented in detail and distributed to the students according to their preferences. In a second session in week 3, an introduction to academic literature research, writing and presentations will take place. Afterwards, the students carry out a literature search under supervision and prepare a presentation and a corresponding paper. As the scientific literature is mostly in English, the paper should also be written in English. Presentations can be held in either English or German and take place in one or more block courses during the last third of the semester.

Additional Information

Limited number of participants

Workload

Estimated effort for this module is 90 hours:

20h – In person events (kickoff meeting, individual preparatory meetings, seminar block)

20h – Literature research

20h – Preparation of presentation

30h – Paper writing

Recommendations

Knowledge in Robotics (e.g. from the class Robotics 1 and follow-ups) is helpful



5.99 Module: Seminar: Explainable Artificial Intelligence [M-INFO-106497]

Organisation: KIT Department of Informatics

Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-113115	Seminar: Explainable Artificial Intelligence	3 CP	Lioutikov

Assessment

See partial achievements (Teilleistung).

Prerequisites

See partial achievements (Teilleistung).

Competence Goal

Students are able to independently understand a complex research topic, present the content in a concise and understandable way and prepare a scientific report summarizing the topic.

Students are able to independently understand a complex research topic, present the content in a concise and understandable way and prepare a scientific report summarizing the topic. Students get a deeper understanding of state-of-the-art learning algorithms and get to know current research challenges.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

Each student will select several related papers in the field of Explainable Artificial Intelligence and study and analyze it in the context of Robot Learning. The organizers will suggest several papers but the students will be encouraged to identify and research additional relevant papers during the semester. The students will then prepare a presentation and a basic scientific research paper.

It is highly recommended to take this seminar in combination with the "Explainable Robot Intelligence" Research Project (Forschungspraktikum), where the students get the chance to deepen their understanding, implement and evaluate their presented work.

Additional Information

It is only possible to resign within two weeks after assignment of the topic.

Workload

Workload = 90 h = 3 ECTS

- Attendance time: 15h
- Self-study: 45h
- Writing a scientific report: 20h
- Preparing a presentation: 10h

Recommendations

We recommend taking this research project after attending the "Explainable Artificial Intelligence" lecture in the summer semester.

We highly recommend to take this seminar in combination with the "Explainable Artificial Intelligence" research project (Forschungspraktikum).

- Experience in Machine Learning is recommended, e.g. through prior coursework.
 - The Computer Science Department offers several great lectures e.g., "Maschinelles Lernen - Grundlagen und Algorithmen" and "Deep Learning"
- A good mathematical background will be beneficial
- Python experience is recommended
- We will use the PyTorch deep learning library. Some prior knowledge in this is helpful but not necessary.

M

5.100 Module: Seminar: Exploring Robotics - Insights from Science Fiction, Research and Society [M-INFO-106651]

Coordinators: TT-Prof. Dr. Barbara Bruno
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits	Grading	Recurrence	Duration	Language	Level	Version
3 CP	graded	Each summer term	1 term	English	4	1

Mandatory			
T-INFO-113398	Seminar: Exploring Robotics - Insights from Science Fiction, Research and Society	3 CP	Bruno

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

The students gain experience with literature research on a current research topic. They explore, understand and compare different approaches to a selected scientific problem. The students are able to write a summary of their literature research in the form of a scientific publication in English and give a scientific talk on it.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

The students choose a topic from the field of robotics (e.g. remote control, behavior-based robotics, human-robot interaction, the "uncanny valley," natural language understanding, machine learning) and conduct a research on it that, building on literature findings, also includes and addresses the perspectives of society and the general media (as given by science fiction books, movies and games, as well as media and news outlets) and technology assessment (including social/societal expectations and needs, ethical implications, and risks/benefits analyses).

Students work under the guidance of a scientific supervisor. At the end of the semester, they present the results and write an elaboration in English in the form of a scientific publication.

Workload

Seminar with 2 SWS, 3 LP.

3 LP corresponds to approx. 90 hours, of which

approx. 45 hours of literature research

approx. 25 hrs. elaboration

approx. 10 hrs. preparation of presentation

approx. 10 hrs. compulsory attendance

Recommendations

Knowledge of the content of modules Robotics I - Introduction to Robotics, Robotics II: Humanoid Robotics, Robotics III - Sensors and Perception in Robotics is helpful.

M**5.101 Module: Seminar: Failing Forward: Robotics, Critical Reading and the Making of Good Research [M-INFO-107436]**

Coordinators: TT-Prof. Dr. Barbara Bruno
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-114604	Seminar: Failing Forward: Robotics, Critical Reading and the Making of Good Research	3 CP	Bruno

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

The students refine their critical reading skills and gain experience with literature research on a current research topic. They can identify and propose good research practices. The students are able to present their findings and reflections in the form of a scientific publication in English and give a scientific talk on it.

Content

The students choose a topic from the field of human-robot interaction (e.g. about robots in public spaces, or robots and diversity, or companion robots for older adults). They then conduct a literature research under the guidance of a scientific supervisor, aimed at identifying what makes good research and good research reporting on the chosen topic. At the end of the semester, they present the results and write an elaboration in English in the form of a short scientific position paper.

Workload

Seminar with 2 SWS, 3 LP.
 3 LP corresponds to approx. 90 hours, of which
 approx. 45 hours of literature research
 approx. 25 hrs. elaboration
 approx. 10 hrs. preparation of presentation
 approx. 10 hrs. compulsory attendance

Recommendations

Knowledge of the content of modules Robotics I - Introduction to Robotics, Robotics II: Humanoid Robotics, Robotics III - Sensors and Perception in Robotics is helpful.

M**5.102 Module: Seminar: From Big Data to Data Science: Advanced Methods of Information Fusion [M-INFO-102305]****Coordinators:** Prof. Dr.-Ing. Uwe Hanebeck**Organisation:** KIT Department of Informatics**Part of:** [Seminars](#)**Credits**
3 CP**Grading**
graded**Recurrence**
Each term**Duration**
1 term**Language**
German/English**Level**
4**Version**
1

Mandatory			
T-INFO-101270	Seminar: From Big Data to Data Science: Advanced Methods of Information Fusion	3 CP	Hanebeck

M**5.103 Module: Seminar: Hot Topics in Artificial Intelligence & Security 1 [M-INFO-106868]****Coordinators:** Prof. Dr. Christian Wressnegger**Organisation:** KIT Department of Informatics**Part of:** [Seminars](#)**Credits**
4 CP**Grading**
graded**Recurrence**
Each winter term**Duration**
1 term**Language**
English**Level**
4**Version**
1

Mandatory			
T-INFO-113761	Seminar: Hot Topics in Artificial Intelligence & Security 1	4 CP	Wressnegger

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students know basic concepts artificial intelligence and machine learning in computer security, and are able to understand/interpret results from state-of-the-art research.

- Students know and understand basic concepts of combining artificial intelligence and computer security.
- Students are able independently research topics and methods.
- Students understand limits of current methods and applications

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work

Content

This seminar is concerned with the combination of artificial intelligence, machine learning and computer security in practice. Many tasks in the security landscape are based on manual labor, such as searching for vulnerabilities or analyzing malware. Here, machine learning can be used to establish a higher degree of automation, providing more "intelligent" security solutions (AI for Security). However, also these learning-based systems can be attacked and need to be secured (Security of AI).

This module is part of a seminar series to intensifies the contents of the AISEC lecture. It can be attended individually and in no particular order. The module puts focus on timely topics from recent research and teaches students to work up results from state-of-the-art research. To this end, the they will read up on a sub-field, prepare a seminar report, and present their work at the end of the term to their colleagues.

Workload

- 30h Literature research
- 60h Elaboration of the seminar paper
- 20h Preparation of final presentation
- 10h attendance time

Recommendations

The basics of IT security and artificial intelligence are a prerequisite.



5.104 Module: Seminar: Hot Topics in Artificial Intelligence & Security 2 [M-INFO-106869]

Coordinators: Prof. Dr. Christian Wressnegger

Organisation: KIT Department of Informatics

Part of: [Seminars](#)

Credits	Grading	Recurrence	Duration	Language	Level	Version
4 CP	graded	Each summer term	1 term	English	4	1

Mandatory			
T-INFO-113762	Seminar: Hot Topics in Artificial Intelligence & Security 2	4 CP	Wressnegger

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students know basic concepts artificial intelligence and machine learning in computer security, and are able to understand/interpret results from state-of-the-art research.

- Students know and understand basic concepts of combining artificial intelligence and computer security.
- Students are able independently research topics and methods.
- Students understand limits of current methods and applications

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work

Content

This seminar is concerned with the combination of artificial intelligence, machine learning and computer security in practice. Many tasks in the security landscape are based on manual labor, such as searching for vulnerabilities or analyzing malware. Here, machine learning can be used to establish a higher degree of automation, providing more "intelligent" security solutions (AI for Security). However, also these learning-based systems can be attacked and need to be secured (Security of AI).

This module is part of a seminar series to intensifies the contents of the AISEC lecture. It can be attended individually and in no particular order. The module puts focus on timely topics from recent research and teaches students to work up results from state-of-the-art research. To this end, the they will read up on a sub-field, prepare a seminar report, and present their work at the end of the term to their colleagues.

Workload

- 30h Literature research
- 60h Elaboration of the seminar paper
- 20h Preparation of final presentation
- 10h attendance time

Recommendations

The basics of IT security and artificial intelligence are a prerequisite.

M

5.105 Module: Seminar: Hot Topics in Bioinformatics [M-INFO-100750]**Coordinators:** Prof. Dr. Alexandros Stamatakis**Organisation:** KIT Department of Informatics**Part of:** [Seminars](#)**Credits**
3 CP**Grading**
graded**Recurrence**
Each summer term**Duration**
1 term**Language**
English**Level**
4**Version**
1

Mandatory			
T-INFO-101287	Seminar: Hot Topics in Bioinformatics	3 CP	Stamatakis

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Participants will be able to understand, critically evaluate and compare current scientific publications in the field of sequence-based bioinformatics. They are able to present, understand, and critically assess the algorithms and models from current publications orally and in writing at a level that corresponds to the quality of scientific publications and conference presentations. They are able to suggest possible extensions to existing work and assess if the results are reproducible.

Content

The field of Bioinformatics is by now established as an independent application area of computer science. One of the main objectives of classical bioinformatics is to generate biological knowledge (usually from molecular data, e.g., DNA data sets) using appropriate models and algorithms. The so-called molecular data flood, which is being driven by increasingly faster and cheaper methods for extracting DNA, presents bioinformatics with new challenges regarding data storage and processing. These challenges range from discrete algorithms on strings and trees to parallel processing of data and large numerical simulations on supercomputers. The aim of the module is to provide an insight into the many facets of current bioinformatics research.

Workload

10 hours of topic selection + 10 hours of attending the seminar lectures + 30 hours of reading and understanding the paper(s) + 10 hours of lecture preparation + 30 hours for writing the report = 90 hours = 3 ECTS

M**5.106 Module: Seminar: Hot Topics in Explainable Artificial Intelligence (XAI) [M-INFO-106392]****Coordinators:** Prof. Dr. Christian Wressnegger**Organisation:** KIT Department of Informatics**Part of:** [Seminars](#)

Credits	Grading	Recurrence	Duration	Language	Level	Version
4 CP	graded	Each summer term	1 term	English	4	1

Mandatory			
T-INFO-112917	Seminar: Hot Topics in Explainable Artificial Intelligence (XAI)	4 CP	Wressnegger

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students know concepts of explainable machine learning and are able to understand/interpret results from state-of-the-art research.

- Students know and understand concepts of methods for explaining machine learning algorithms.
- Students are able independently research topics and methods in the field of explainable machine learning.
- Students understand limits of current approaches for explaining machine learning.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

This seminar is concerned with explainable machine learning in computer security. Learning-based systems often are difficult to interpret, and their decisions are opaque to practitioners. This lack of transparency is a considerable problem in computer security, as black-box learning systems are hard to audit and protect from attacks.

The module introduces students to the emerging field of explainable machine learning and teaches them to work up results from recent research. To this end, the students will read up on a sub-field, prepare a seminar report, and present their work at the end of the term to their colleagues.

Topics cover different aspects of the explainability of machine learning methods for the application in computer security in particular.

Workload

- 24h literature research
- 48h Elaboration of the seminar paper
- 24h Review of preliminary work by fellow students
- 16h preparation of final presentation
- 8h attendance time

In total 120h

M**5.107 Module: Seminar: Information Systems [M-INFO-107686]**

Coordinators: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-115055	Seminar: Information Systems	3 CP	Böhm

Assessment

See Partial Achievements (Teilleistung).

Prerequisites

See Partial Achievements (Teilleistung).

Competence Goal

- Students receive an initial introduction to scientific work in a specific specialist area in the field of information systems.
- Working on the seminar paper also prepares students for writing their Master's thesis.
- By attending the seminars, students are taught not only techniques of scientific work but also key qualifications.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines when writing their scientific work.

Content

The Chair of Information Management Systems offers at least one seminar per semester on a selected information systems topic (every seminar at the "Chair of Information Management Systems" that is not a proseminar counts as an "Information Systems Seminar").

These are usually current research topics, for example from the fields of databases, data mining or workflow management.

Details are announced each semester (notices and homepage of the Chair of Information Management Systems).

Workload

- General introduction 2h
- Introduction to presentations 2h
- Reading and understanding articles and publications 6x4,5h=27h
- Creating a paper 6x4,5h=27h
- Creating a presentation 6x4,5h=27h
- Lectures 10x0.5h=5h

Total = 90h (3 ECTS)

Recommendations

Lectures of the Chair of Information Management Systems that match the topic of the seminar are strongly recommended.



5.108 Module: Seminar: Interpretability and Causality in Machine Learning [M-INFO-107217]

Coordinators: Jun.-Prof. Dr. Jan Stühmer
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits	Grading	Recurrence	Duration	Language	Level	Version
3 CP	graded	Each summer term	1 term	English	4	1

Mandatory			
T-INFO-114237	Seminar: Interpretability and Causality in Machine Learning	3 CP	Stühmer

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Qualification target:

Students acquire the foundations of scientific literature research, writing of a scientific report, and presenting their results in front of an audience.

Learning objectives:

Students independently acquire an understanding of their research topic from scientific literature such as conference papers, journal papers and textbooks.

They are able to independently present the content in a concise and understandable way in a written report and in a presentation in front of an audience.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

Topic of this Masterseminar are machine learning approaches and deep learning methods for learning of interpretable representations. These methods enable to reconstruct underlying principles from data, for example the reconstruction of generative factors of a dataset.

Starting from these methods for interpretable representations, we will discuss further methods for causal discovery, that enable the inference of causal dependencies in data.

Methods and algorithms covered include for example variational inference, contrastive learning, as well as statistical methods for factor analysis.

There will be a kick-off meeting at the beginning of the semester and 2-3 block seminars towards the end of the term.

Dates for both will still be determined.

The Masterseminar will be held in English language.

Workload

90h

Recommendations

Attendance of the lecture "Machine Learning - Fundamentals and Algorithms" is recommended.

M**5.109 Module: Seminar: Learning Causality - a Challenge for Human and Artificial Intelligence [M-INFO-107033]**

Coordinators: Dr. Dominik Janzing
Prof. Dr. Gerhard Neumann

Organisation: KIT Department of Informatics

Part of: [Seminars](#)

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

Mandatory			
T-INFO-114102	Seminar: Learning Causality - a Challenge for Human and Artificial Intelligence	3 CP	Janzing

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

The student

- understands the problem of causal inferences based on statistical data analysis.
- understands the existing approaches to machine learning of causal structures and can evaluate them critically.
- discusses, presents and defends subject-specific arguments within a given task;
- organizes the preparation of a seminar paper largely independently.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

Although traditional statistical methods can show statistical correlations between observed variables, they make no statement about the underlying causal relationship. However, the question of cause and effect is often the central question, both in purely academic scientific research and in industrial applications. It is only in the last 2-3 decades that scientists in the fields of machine learning, statistics, philosophy and physics have begun to realize that statistical data do contain information about causality, even if it is still not easy to extract this information. The seminar provides an insight into the latest research results in causal data analysis.

Workload

Workload = 90 h = 3 ECTS

Attendance time: 15h

Self-study: 45h

Writing a scientific report: 20h

Preparing a presentation: 10h

Recommendations

The seminar is aimed at students of computer science, but also other subjects if they have a good mathematical background and interest (e.g. mathematics, physics, psychology).

Basic concepts of probability theory are assumed

M

5.110 Module: Seminar: Neural Networks and Artificial Intelligence [M-INFO-102412]

Coordinators: Prof. Dr. Jan Niehues

Organisation: KIT Department of Informatics

Part of: [Seminars](#)

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

Mandatory			
T-INFO-104777	Seminar: Neural Networks and Artificial Intelligence	3 CP	Niehues



5.111 Module: Seminar: Practical Graph Algorithms [M-INFO-107264]

Coordinators: Prof. Dr. Henning Meyerhenke

Organisation: KIT Department of Informatics

Part of: [Seminars](#)

Credits
4 CP

Grading
graded

Recurrence
Irregular

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-114297	Seminar: Practical Graph Algorithms	4 CP	Meyerhenke

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students are able to:

- perform a literature review on the basis of a given topic/scientific paper, to read and understand relevant scientific works in algorithm engineering for graph problem and to identify the scientific context.
- present a scientific paper and its context. This includes competency in tools and techniques for making the content accessible for a target audience.
- create a written report of their topic in accordance to usual quality standards for scientific writing
- critically assess the work of other participants and make constructive suggestions for improvement.
- Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

This seminar covers various topics from the field of practical graph algorithms such as small subgraph detection, graph robustness, centrality computations, and related ones. The exact focus of the seminar for the current semester will be announced in advance on the website of Prof. Meyerhenke's chair. Participants in the seminar carry out their own literature research, present their results to their fellow students and prepare a paper.

The seminar will be held in several blocks, partially online, partially on-site. The exact formalities will be announced at an online kick-off event at the beginning of the semester, which will also be announced on the course website mentioned above.

Workload

4 LP corresponds to approx. 120 working hours, of which

- 15h seminar attendance
- 35h Literature research, assessment and evaluation of relevant literature
- 35h preparation of own presentation
- 35h preparation of the scientific report

Recommendations

Knowledge of algorithms, in particular graph algorithms, is a clear advantage. Exemplary lectures are Algorithms I and Algorithms II.

M

5.112 Module: Seminar: Privacy and Security [M-INFO-107216]

Coordinators: Prof. Dr. Thorsten Strufe
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
4 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-114236	Seminar: Privacy and Security	4 CP	Strufe

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

The student is able to

- conduct a literature search based on a given topic, identify and evaluate the relevant literature;
- independently compile research results from IT security and technical data protection;
- analyze and discuss scientific studies and place them in their context;
- conduct their own classifications and evaluations of scientific studies, report on them in writing and present the results in a short scientific presentation.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

The seminar deals with current topics from the research field of data protection and security.

These include, for example:

- Privacy attacks on communication
- Network security
- Anonymized online services
- Evaluation of the anonymity of online services
- Anonymized publication of data (differential privacy, k-anonymity)
- Transparency/awareness-enhancing systems
- Behavioral analysis of media use
- Biometric authentication

Workload

Seminar attendance time: 10h

Researching and writing a paper: 75h

Reviewing and commenting on the preliminary papers of fellow students: 5h

Preparing the presentation: 30h

Recommendations

Fundamentals of IT security, computer networks and distributed systems are required



5.113 Module: Seminar: Proofs from THE BOOK [M-INFO-103306]

Coordinators: Prof. Dr. Peter Sanders
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Irregular

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-106604	Seminar: Proofs from THE BOOK	3 CP	Sanders

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

The students learn to follow and understand complex mathematical proofs on their own. They learn to represent these proofs in an appealing manner and present the proofs to the other participants using a blackboard.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

According to the Hungarian mathematician Paul Erdős, God is keeping a book – the BOOK – under wraps that contains the most elegant mathematical proofs. Erdős' loftiest goal was to find such proofs from the BOOK.

After Erdős' death in 1996, Martin Aigner and Günter Ziegler published the book "Proofs from THE BOOK" in 1998. The book has also been published in German with the title "Das BUCH der Beweise". In Aigner and Ziegler's collection, there are some 40 of the most elegant proofs which are handled as candidates for BOOK-proofs.

In this seminar, the participants will present and discuss proofs from "Proofs from THE BOOK" and other well known and well studied proofs in the area of mathematics and informatics.

Workload

Seminar with 2 SWS, 3 LP

3 LP correspond to about 90h of work, split into

about 20h attendance

about 60h preparation for seminar

about 10h follow-up

Recommendations

The German version "Das Buch der Beweise" is available online at the KIT library within the KIT network. The English version "Proofs from THE BOOK" is available as a physical copy at the KIT library. We recommend having a look inside either version before registering for this seminar.

M

5.114 Module: Seminar: Recent Highlights in Algorithms [M-INFO-107172]

Coordinators: TT-Prof. Dr. Thomas Bläsius
Prof. Dr. Peter Sanders

Organisation: KIT Department of Informatics

Part of: [Seminars](#)

Credits
4 CP

Grading
graded

Recurrence
Irregular

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-114201	Seminar: Recent Highlights in Algorithms	4 CP	Bläsius, Sanders, Ueckerdt

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students can,

- carry out a literature search based on a given topic, identify, locate, evaluate and finally analyse the relevant literature.
 - prepare presentations in a scientific context. To this end, students master techniques that enable them to prepare and present the content to be presented in a manner suitable for an audience.
 - prepare their written seminar paper (as required later for further academic work) in accordance with the requirements and quality standards of academic writing, taking into account the format requirements specified by academic publishers for the publication of documents.
 - critically assess the work of other participants and make constructive suggestions for improvement.
- Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

The seminars offered as part of this seminar module deal with current topics in algorithm technology and explore them in depth. As a rule, the prerequisite for passing the module is the preparation of a written paper of max. 15 pages and an oral presentation of at least 45 minutes.

Workload

Seminar with 2SWS, 4LP

4 LP corresponds to approx. 120 working hours, of which

approx. 10h seminar attendance

approx. 40 hours of literature research, assessment and evaluation of relevant literature

approx. 30h preparation of own presentation

approx. 30 hours writing the paper

approx. 10h Reading two papers and formulating constructive criticism and suggestions for improvement in writing

M**5.115 Module: Seminar: Research Trends in Human-Computer Interaction [M-INFO-106594]****Coordinators:** Prof. Dr. Kathrin Gerling**Organisation:** KIT Department of Informatics**Part of:** [Seminars](#)**Credits**
3 CP**Grading**
graded**Recurrence**
Each term**Duration**
1 term**Language**
German/English**Level**
4**Version**
2

Mandatory			
T-INFO-113284	Seminar: Research Trends in Human-Computer Interaction	3 CP	Gerling

M

5.116 Module: Seminar: Robot Reinforcement Learning [M-INFO-105379]

Coordinators: Prof. Dr. Gerhard Neumann
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits 3 CP	Grading graded	Recurrence Irregular	Duration 1 term	Language German	Level 4	Version 1
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Mandatory			
T-INFO-110862	Seminar: Robot Reinforcement Learning	3 CP	Neumann



5.117 Module: Seminar: Secure Multiparty Computation [M-INFO-105761]

Coordinators: Prof. Dr. Jörn Müller-Quade
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Irregular

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-111501	Seminar: Secure Multiparty Computation	3 CP	Müller-Quade

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students learn to familiarize themselves thoroughly with scientific papers, to present them to other students and to deal with questions on their topic in a subsequent discussion round.

Students will be able to differentiate between different protocols for secure multiparty computation and weigh up their advantages and weaknesses.

Students will be able to present academic publications from the research field of secure multiparty computation in a suitable manner, place them in the historical context of the research field and critically examine the results and findings presented.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and apply these guidelines successfully in the preparation of their academic work.

Content

In the setting of secure multiparty computation, two or more parties with private inputs wish to compute some joint function of their inputs. The security requirements of such a computation are privacy (meaning that the parties learn the output and nothing more), correctness (meaning that the output is correctly distributed), independence of inputs, and more. Due to its generality, secure computation is a central tool in cryptography.

In this seminar, we examine modern protocols for secure multiparty computation of arbitrary functions.

Workload

Attendance time in seminar: 15 h

Meeting with supervisors: 5 h

Independent work in relation to the individual seminar topic: 70 h

Recommendations

Knowledge of the content of the lecture Cryptographic Protocols is assumed.

M

5.118 Module: Seminar: Service-Oriented Architectures [M-INFO-102372]

Coordinators: Prof. Dr. Sebastian Abeck
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

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

Mandatory			
T-INFO-104740	Seminar: Service-Oriented Architectures	3 CP	Abeck

M**5.119 Module: Seminar: Software Architecture, Security and Privacy [M-INFO-107236]**

Coordinators: Prof. Dr. Ralf Reussner
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits	Grading	Recurrence	Duration	Language	Level	Version
4 CP	graded	Irregular	1 term	English	4	1

Mandatory			
T-INFO-114260	Seminar: Software Architecture, Security and Privacy	4 CP	Reussner

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students can,

- carry out a literature search based on a given topic, identify, locate, evaluate and finally analyze the relevant literature.
- prepare their seminar paper (and later their Bachelor's/Master's thesis) with a minimum of training, taking into account the format requirements specified by all publishers for the publication of documents.
- Preparing presentations in a scientific context. To this end, techniques are introduced that make it possible to prepare and present the content to be presented in an auditorium-appropriate manner.
- present the results of their research in written form, as is generally the case in scientific publications.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and apply these guidelines successfully in the preparation of their scientific work.

Content

Anyone who processes personal data automatically must effectively protect this data from unauthorized access in order to act in accordance with data protection laws, but also to prevent damage to reputation and trustworthiness should data protection violations become public. Protecting personal data from unauthorized access and complying with other data protection obligations is therefore actually one of the most important goals in software design and operation.

However, looking at data protection in isolation does not do justice to reality. If an attacker gains access to personal data, voluntary commitments and internal data protection regulations no longer apply. In case of doubt, the operator of the software is liable for severe fines. Effective security precautions are therefore indispensable as a mainstay for protecting personal data.

Security-critical vulnerabilities must be identified at an early stage, ideally before the vulnerability is introduced. Such quality assessments are performed by software architecture-based analyses. How security can be described and analyzed at the software architecture level is the subject of ongoing research, as is the question of whether - and how - security can be expressed in figures.

In this seminar, students deal with these questions and the state of research at the interface between data protection, security and software architecture. Possible topics are located in one or more of these areas.

Workload

25 working hours for literature research
 55 working hours for writing the thesis and preparing peer reviews
 20 working hours for preparing the final presentation
 20 working hours for the final block event and meeting with the supervisor.
 This results in a total of 120 working hours

M**5.120 Module: Seminar: Software Quality Assurance and Software Test [M-INFO-105895]****Coordinators:** Prof. Dr.-Ing. Ina Schaefer**Organisation:** KIT Department of Informatics**Part of:** [Seminars](#)**Credits**
4 CP**Grading**
graded**Recurrence**
Each summer term**Duration**
1 term**Language**
German/English**Level**
4**Version**
2

Mandatory			
T-INFO-111850	Seminar: Software Quality Assurance and Software Test	4 CP	Schaefer

M

5.121 Module: Seminar: Speech-to-Speech Translation [M-INFO-107179]

Coordinators: Prof. Dr. Jan Niehues
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
3 CP

Grading
graded

Recurrence
Each summer term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-114208	Seminar: Speech-to-Speech Translation	3 CP	Niehues

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students learn to familiarise themselves independently with topics based on academic literature and prepare them for presentations.

From the other presentations, students gain in-depth knowledge in sub-areas of language-to-language translation

By evaluating the presentations of their fellow students, students improve their social skills.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Content

Speech-to-speech translation is a popular application that combines automatic speech recognition and machine translation. However, a user-friendly combination requires more than just a linear connection of the individual techniques.

In this seminar, students work independently on individual topics from the fields of automatic speech recognition, machine translation and their combination into speech-to-speech translation systems using the literature provided and present the summarised findings to the other participants in the seminar in the form of a slide-based presentation.

Workload

90 h

M

5.122 Module: Seminar: Ubiquitous Systems [M-INFO-101880]

Coordinators: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: [Seminars](#)

Credits
4 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German

Level
4

Version
1

Mandatory			
T-INFO-103578	Seminar: Ubiquitous Systems	4 CP	Beigl

Workload

The total workload for this course unit is approx. 120 hours (4.0 credits).

Activity

Workload

Attendance time: Kickoff, presentation and discussion and meeting with supervisors: 10 h

Literature research and writing the paper: 106 h

Preparing the presentation: 4 h

TOTAL: 120 h 00 min

M**5.123 Module: Software Engineering I [M-INFO-101175]**

Coordinators: Prof. Dr.-Ing. Ina Schaefer
Organisation: KIT Department of Informatics
Part of: [Informatics \(mandatory\)](#)

Credits
6 CP

Grading
graded

Recurrence
Each summer term

Duration
1 term

Language
German

Level
2

Version
1

Mandatory			
T-INFO-101968	Software Engineering I	6 CP	Schaefer
T-INFO-101995	Software Engineering I Pass	0 CP	Schaefer

Competence Goal

The students acquire basic knowledge about the principles, methods and tools of software engineering. They learn how to build and to maintain complex software systems in a systematic way.

Content

The content of the lecture is the entire lifecycle of software, spanning project planning, system analysis, cost estimation, design, implementation, validation, verification, and finally the maintaining of software. The covered topics include UML, design patterns, software tools, programming environments and configuration control/versioning systems.

Workload

approx. 180 h

M**5.124 Module: Software Engineering II [M-INFO-107235]**

Coordinators: Prof. Dr.-Ing. Anne Koziolk
 Prof. Dr. Raffaella Mirandola
 Prof. Dr. Ralf Reussner

Organisation: KIT Department of Informatics

Part of: [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)

Credits	Grading	Recurrence	Duration	Language	Level	Version
6 CP	graded	Each summer term	1 term	English	4	1

Mandatory			
T-INFO-114259	Software Engineering II	6 CP	Koziolk, Mirandola, Reussner

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Software processes: Students understand evolutionary and incremental development and can describe the advantages over the sequential approach. They can describe the phases and disciplines of the unified process.

Requirements engineering: Students can describe the terms of requirements engineering and name activities in the requirements engineering process. They can classify and assess requirements according to the facets of type and representation. They can apply basic guidelines for specifying natural language requirements and describe prioritization procedures for requirements. Describe the purpose and elements of use case models. You can classify use cases according to their granularity and objectives. You can create use case diagrams and use cases. They can derive system sequence diagrams and operation contracts from use cases and can describe their role in the software development process.

Software architecture: Students can reproduce and explain the definition of software architecture and software components. They can explain the difference between software architecture and software architecture documentation. They can describe the advantages of explicit architecture and the factors influencing architecture decisions. You can assign design decisions and elements to the layers of an architecture. You will be able to describe what component models define. They can describe the components of the Palladio component model and discuss some of the design decisions made.

Enterprise Software Patterns: Students can characterize enterprise applications and decide for a described application which properties it fulfills. They know patterns for structuring domain logic, architectural patterns for data access and object-relational structure patterns. They can select a suitable pattern for a design problem and justify the selection based on the advantages and disadvantages of the patterns.

Software design: Students can assign the responsibilities resulting from system operations to classes or objects in object-oriented design using the GRASP patterns and thus design object-oriented software.

Software quality: Students know the principles for readable program code, can identify violations of these principles and develop proposals for solutions.

Model-driven software development: Students can describe the goals and the idealized division of labor of model-driven software development (MDSD) and reproduce and explain the definitions for model and metamodel. They can discuss the goals of modeling. You will be able to describe the model-driven architecture and express constraints in the Object Constraint Language. You can express simple transformation fragments of model-to-text transformations in a template language. You can weigh up the advantages and disadvantages of MDSD.

Embedded systems: Students will be able to explain the principle of a real-time system and why they are usually implemented as parallel processes. They can describe a rough design process for real-time systems. They can describe the role of a real-time operating system. They can distinguish between different classes of real-time systems.

Reliability: Students can describe the various dimensions of reliability and categorize a given requirement. They can illustrate that unit tests are not sufficient to evaluate software reliability and can describe how usage profile and realistic error data have an influence.

Domain-driven design (DDD): Students are familiar with the design metaphor of ubiquitous language, Closed Contexts, and Strategic Design. They can describe a domain using the DDD concepts, entity, value objects, services, and improve the resulting domain model using the patterns of aggregates, factories, and depots. They know the different types of interactions between Closed Contexts and can apply them.

Security (in the sense of security): Students can describe the basic ideas and challenges of security assessment. They can recognize common security problems and propose solutions.

Content

Requirements engineering, software development processes, software quality, software architectures, MDD, Enterprise Software Patterns software maintainability, software security, dependability, embedded software, middleware, domain-driven design

Additional Information

The Software Engineering II module is a basic module.

Workload

Preparation and follow-up time 1.5 h / 1 SWS

Total workload:

$(4 \text{ SWS} + 1.5 \times 4 \text{ SWS}) \times 15 + 30 \text{ h exam preparation} = 180 \text{ h} = 6 \text{ ECTS}$

M**5.125 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 and Management \(Statistics\)](#)
[Economics and Management \(Economics\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German/English

Level
3

Version
7

Mandatory			
T-WIWI-114622	Introduction to Econometrics	5 CP	Schienle
Supplementary Courses (Elective: 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 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 "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 techniques necessary to conduct valid regression, time series and multivariate analysis.

Workload

The total workload for this module is approximately 270 hours.

M

5.126 Module: Statistics and Econometrics II [M-WIWI-105414]**Coordinators:** Prof. Dr. Melanie Schienle**Organisation:** KIT Department of Business and Economics**Part of:** [Economics and Management \(Business Administration\)](#)**Credits**
9 CP**Grading**
graded**Recurrence**
Each term**Duration**
1 term**Language**
German/English**Level**
4**Version**
5

Compulsory Elective Courses (Elective:)			
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 techniques for regression, time series and multivariate analysis.

Workload

The total workload for this module is approximately 270 hours.

M**5.127 Module: Strategy and Organization [M-WIWI-101425]**

Coordinators: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Business and Economics
Part of: [Economics and Management \(Business Administration\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
2 terms

Language
German

Level
3

Version
7

Strategy and Organization (Elective: at least 9 credits)			
T-WIWI-102630	Managing Organizations	4,5 CP	Lindstädt
T-WIWI-113090	Strategic Management	4,5 CP	Lindstädt

Assessment

The module examination takes the form of written partial examinations (according to §4(2), 1 SPO) on the individual courses of the module. The examinations are offered every semester and can be repeated at any regular examination date.

The competence certificate is described for each course in this module. The grade of the individual partial examinations corresponds to the respective examination grade. The overall grade of the module is calculated from the CP-weighted grades of the partial examinations and cut off after the first decimal place.

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.

M

5.128 Module: Supply Chain Management [M-WIWI-101421]**Coordinators:** Prof. Dr. Stefan Nickel**Organisation:** KIT Department of Business and Economics**Part of:** [Economics and Management \(Business Administration\)](#)**Credits**
9 CP**Grading**
graded**Recurrence**
Each term**Duration**
1 term**Language**
German/English**Level**
3**Version**
11

Mandatory			
T-WIWI-107506	Platform Economy	4,5 CP	Weinhardt
Supplementary Courses (Elective: 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

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 course T-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.

M

5.129 Module: Team Project Software Development [M-INFO-104809]

Coordinators:

Prof. Dr. Sebastian Abeck
Prof. Dr. Ralf Reussner

Organisation:

KIT Department of Informatics

Part of:

Information Systems

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

Mandatory			
T-INFO-109823	Team Project Software Development	8 CP	Abeck, Reussner

M

5.130 Module: Telematics [M-INFO-107243]

Coordinators: Prof. Dr. Martina Zitterbart
Organisation: KIT Department of Informatics
Part of: [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)

Credits
6 CP

Grading
graded

Recurrence
Each winter term

Duration
1 term

Language
English

Level
4

Version
1

Mandatory			
T-INFO-114269	Telematics	6 CP	Zitterbart

Assessment

See partial achievements (Teilleistung)

Prerequisites

See partial achievements (Teilleistung)

Competence Goal

Students

- master protocols, architectures, and methods and algorithms that are used on the Internet for routing and for establishing a reliable end-to-end connection, as well as various media allocation procedures in local networks.
- have an understanding of the systems and the problems that appear in a global, dynamic network as well as the mechanisms used to remedy them.
- are familiar with current developments such as SDN and data center networking.
- know methods to manage and administrate networks.

Students master the basic protocol mechanisms for establishing reliable end-to-end communication. Students have detailed knowledge of the mechanisms used in TCP for congestion and flow control and can discuss the issue of fairness with multiple parallel transport streams. Students can analytically determine the performance of transport protocols and know methods that fulfill special requirements of TCP, such as high data rates and short latencies. Students are familiar with current topics such as problems introduced by utilization of middle boxes in the Internet, the use of TCP in data centers and multipath TCP. Students can use transport protocols in practice.

Students know the functions of routers in the Internet and can reproduce and apply common routing algorithms. Students can reproduce the architecture of a router and know different approaches to buffer placement as well as their advantages and disadvantages.

Students understand the distinction of routing protocols into interior and exterior gateway protocols and have detailed knowledge of the functionality and properties of common protocols such as RIP, OSPF and BGP. The students are familiar with current topics such as SDN.

Students know the function of media allocation and can classify and analytically evaluate media allocation processes. Students have in-depth knowledge of Ethernet and are familiar with various Ethernet forms and their differences, especially current developments such as real-time Ethernet and data center Ethernet. Students can reproduce and apply the spanning tree protocol. Students can reproduce the technical characteristics of DSL. Students are familiar with the concept of label switching and can compare existing approaches such as MPLS.

Content

- Introduction
- End-to-end data transport
- Routing protocols and architectures
- Media allocation
- Bridges
- Data transmission
- Further selected examples
- Network management

Workload

Lecture with 3 SWS plus follow-up/exam preparation, 6 CP.

6 CP corresponds to approx. 180 working hours, of which

approx. 60 hours lecture attendance

approx. 60 hours preparation/follow-up work

approx. 60 hours exam preparation

M**5.131 Module: Theoretical Informatics [M-INFO-101189]**

Coordinators: Prof. Dr. Jörn Müller-Quade
Prof. Dr. Dorothea Wagner

Organisation: KIT Department of Informatics

Part of: Informatics (mandatory)

Credits	Grading	Recurrence	Duration	Language	Level	Version
6 CP	graded	Each winter term	1 term	German/English	2	1

Mandatory			
T-INFO-103235	Theoretical Foundations of Computer Science	6 CP	Künnemann, Ueckerdt

Assessment

The assessment of the module consists of a written examination according to §4(2), 1 of the examination regulations. The grade of the module corresponds to the grade of the written examination. Further details see the german section.

Competence Goal

The student

- has a deeper insight into the fundamentals of theoretical computer science and knows the computation models and proof techniques,
- understands the limits and possibilities of computer science in relation to the solution of definable but only partially predictable problems
- knows basic aspects of computer science in contrast to specific circumstances, such as specific computers or programming languages and also can phrase general statements about the solvability of problems
- is able to apply the proof techniques learned for the specification of systems of computer science and for the systematic design of programs and algorithms

Content

There are important problems whose solutions can clearly be defined but one will never be able to calculate such a solution systematically. Other problems are "likely" to be solved only through trial and error. Other topics of the module provide the basis for circuit design, design of compilers, and many others. Most results are rigorously proved. The proof techniques learned by the way are important for the specification of systems of computer science and for the systematic design of programs and algorithms.

The module provides a deep insight into the principles and methods of theoretical computer science. In particular, this will be discussed on the basic properties of Formal Languages as foundations of programming languages and communication protocols (regular, context-free Chomsky hierarchy), machine models (finite automata, pushdown automata, Turing machines, non determinism, and relations to families of formal languages), equivalence of sufficiently powerful computation models (Church's thesis), non computable important functions (halting problem,...), Gödel's incompleteness theorem and introduction to complexity theory, NP-complete problems and polynomial reductions.

Workload

approx. 210 h

M

5.132 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: [Economics and Management \(Business Administration\)](#)

Credits
9 CPGrading
gradedRecurrence
Each termDuration
1 termLanguage
German/EnglishLevel
3Version
11

Compulsory Elective Courses (Elective:)			
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 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

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.

M

5.133 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: [Economics and Management \(Business Administration\)](#)

Credits
9 CP

Grading
graded

Recurrence
Each term

Duration
1 term

Language
German/English

Level
3

Version
12

Compulsory Elective Courses (Elective: 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 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

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.

M**5.134 Module: Visual Computing [M-INFO-107682]****Coordinators:** Prof. Dr.-Ing. Carsten Dachsbacher**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
3 CP**Grading**
graded**Recurrence**
Each summer term**Duration**
1 term**Language**
German**Level**
2**Version**
1

Mandatory			
T-INFO-115050	Visual Computing	3 CP	Dachsbacher

M**5.135 Module: Web Applications and Service-Oriented Architectures (I) [M-INFO-101636]****Coordinators:** Prof. Dr. Sebastian Abeck**Organisation:** KIT Department of Informatics**Part of:** [Informatics \(Compulsory Elective Modules in Informatics\)](#)
[Informatics \(Compulsory Elective Modules in Informatics\)](#)**Credits**
4 CP**Grading**
graded**Recurrence**
Each winter term**Duration**
1 term**Language**
German**Level**
3**Version**
1

Mandatory			
T-INFO-103122	Web Applications and Service-Oriented Architectures (I)	4 CP	Abeck

6 Module components

T

6.1 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-101438 - Semantic Knowledge Management](#)
[M-WIWI-101476 - Business Processes and Information Systems](#)

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 / 	Schiefer, Toussaint
WT 25/26	2512554	Praktikum Security, Usability and Society (Bachelor)	3 SWS	Practical course / 	Volkamer, Strufe, Berens, Fallahi, Ballreich, Hennig, Länge, Mossano, Hilt
ST 2026	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / 	Schiefer, Toussaint, Kruse
ST 2026	2512206	Lab Agentic AI im Smart IoT Office (Bachelor)	3 SWS	Practical course / 	Oberweis, Rybinski, Ullrich
ST 2026	2512554	Practical Course: Security, Usability and Society	3 SWS	Practical course / 	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)			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:

**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>

**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.

**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>

**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.

**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**6.2 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-101476 - Business Processes and Information Systems](#)

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 / 	Schiefer, Toussaint
ST 2026	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / 	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)	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

6.3 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-107688 - Information Security: Theory and Practice](#)

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 / 	Volkamer, Strufe, Berens, Fallahi, Ballreich, Hennig, Länge, Mossano, Hilt
WT 25/26	2512555	Praktikum Security, Usability and Society (Master)	3 SWS	Practical course / 	Volkamer, Strufe, Berens, Fallahi, Ballreich, Hennig, Länge, Mossano, Hilt
ST 2026	2512554	Practical Course: Security, Usability and Society	3 SWS	Practical course / 	Volkamer, Strufe, Hennig, Länge, Fallahi, Ballreich, Sikra, Hilt, Reimer, Algedri, Mack
ST 2026	2512555	Praktikum Security, Usability and Society (Master)	3 SWS	Practical course / 	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.



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.



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.

**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

6.4 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

6.5 Module component: Algorithms for Planar Graphs [T-INFO-101986]

Coordinators: Dr. rer. nat. Torsten Ueckerdt
Organisation: KIT Department of Informatics
Part of: [M-INFO-101220 - Algorithms for Planar Graphs](#)

Type
Oral examination

Credits
5 CP

Grading
graded

Term offered
Irregular

Version
2

Courses					
ST 2026	2400144	Algorithmen für planare Graphen (mit Übungen)	3 SWS	Lecture / Practice / 	Ueckerdt, Merker, Schneider
Exams					
WT 25/26	7500227	Algorithms for Planar Graphs			Ueckerdt

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.6 Module component: Algorithms for Planar Graphs - Pass [T-INFO-114999]

Coordinators: Dr. rer. nat. Torsten Ueckerdt
Organisation: KIT Department of Informatics
Part of: [M-INFO-101220 - Algorithms for Planar Graphs](#)

Type	Credits	Grading	Expansion	Version
Coursework (practical)	0 CP	pass/fail	1 semesters	1

Courses					
ST 2026	2400144	Algorithmen für planare Graphen (mit Übungen)	3 SWS	Lecture / Practice / 	Ueckerdt, Merker, Schneider

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.7 Module component: Algorithms I [T-INFO-100001]**Coordinators:** TT-Prof. Dr. Thomas Bläsius**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-100030 - Algorithms I](#)**Type**
Written examination**Credits**
6 CP**Grading**
graded**Term offered**
Each summer term**Version**
1

Courses					
ST 2026	24500	Algorithms I	4 SWS	Lecture / Practice / 	Sanders, Uhl, Schimek, Laupichler, Borowitz
Exams					
WT 25/26	7500117	Algorithms I			Sanders

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The performance assessment consists of a written final examination in accordance with Section 4 (2) No. 1 SPO lasting 120 minutes.

The lecturer may award a grade bonus of max. 0.4 (equivalent to one grade step) for good performance in the exercise for the Algorithmen I course.

This grade bonus is only valid for one examination in the same semester. After that, the grade bonus expires.

T

6.8 Module component: Algorithms II [T-INFO-114225]

Coordinators: Prof. Dr. Peter Sanders
Organisation: KIT Department of Informatics
Part of: [M-INFO-107201 - Algorithms II](#)

Type
Written examination

Credits
6 CP

Grading
graded

Term offered
Each winter term

Version
1

Courses					
WT 25/26	2424079	Algorithms II	4 SWS	Lecture / 	Sanders, Künnemann, Redzic, Stieß
Exams					
WT 25/26	7500245	Algorithms II			Künnemann
ST 2026	7500080	Algorithms II - Nachklausur			Künnemann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is carried out as a written examination (§ 4 Abs. 2 No. 1 SPO) lasting 120 minutes.

Prerequisites

None.

Below you will find excerpts from courses related to this module component:

V

Algorithms II

2424079, WS 25/26, 4 SWS, Language: English, [Open in study portal](#)

Lecture (V)
On-Site

Content

This module is designed to provide students with the basic theoretical and practical aspects of algorithm design, analysis, and engineering. It teaches general methods for designing and analyzing algorithms for basic algorithmic problems, as well as the basic principles of general algorithmic methods such as approximation algorithms, linear programming, randomized algorithms, parallel algorithms, and parameterized algorithms.

The student has an in-depth insight into the theoretical and practical aspects of algorithms and is able to identify and formally formulate algorithmic problems in various application areas. Furthermore, they know advanced algorithms and data structures from the areas of graph algorithms, algorithmic geometry, string matching, algebraic algorithms, combinatorial optimization, and external memory algorithms. They are able to independently understand algorithms they are unfamiliar with, associate them with the above areas, apply them, determine their running time, evaluate them, and select appropriate algorithms for given applications. Furthermore, the student is able to adapt existing algorithms to related problems. In addition to algorithms for concrete problems, the student knows advanced techniques of algorithmic design. This includes parameterized algorithms, approximation algorithms, online algorithms, randomized algorithms, parallel algorithms, linear programming, and algorithm engineering techniques. For given algorithms, the student is able to identify techniques used to better understand these algorithms. In addition, they are able to select appropriate techniques for a given problem and use them to design their own algorithms.

Organizational issues

Erfolgskontrolle

See partial achievements (Teilleistung)

Voraussetzungen

See partial achievements (Teilleistung)

Arbeitsaufwand

Vorlesung mit 3 SWS + 1 SWS Übung.

6 LP entspricht ca. 180 Stunden

ca. 45 Std. Vorlesungsbesuch,

ca. 15 Std. Übungsbesuch,

ca. 90 Std. Nachbearbeitung und Bearbeitung der Übungsblätter

ca. 30 Std. Prüfungsvorbereitung

Lecture with 3 semester hours + 1 semester hour exercise

6 ECTS correspond to about 180 hours

about 45h visiting the lectures

about 15h visiting the exercises

about 90h follow-up of lectures and solving the exercise sheets

about 30h preparation for the exam

Literature

K. Mehlhorn, P. Sanders: Algorithms and Data Structures - The Basic Toolbox

Mehlhorn, Naeher: The LEDA Platform of Combinatorial and Geometric Computing Topic: Algorithm Engineering, Flows, Geometrie

Ahuja, Magnanti, Orlin: Network Flows

de Berg, Cheong, van Kreveld, Overmars: Computational Geometry: Algorithms and Applications

Gonzalo Navarro: Compact Data Structures "A Practical Approach", Cambridge University Press

R. Niedermeier: Invitation to Fixed-Parameter Algorithms, Oxford University Press, 2006.

T

6.9 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**6.10 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-101438 - Semantic Knowledge Management](#)

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 / 	Käfer, Kinder, Li
WT 25/26	2511315	Exercises to Applied Informatics - Applications of Artificial Intelligence	1 SWS	Practice / 	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 preparation and postprocessing: 60 hours
- Exam and exam preparation: 30 hours

**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

6.11 Module component: Applied Informatics – Cybersecurity [T-WIWI-114156]

Coordinators: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Business and Economics
Part of: [M-WIWI-101430 - Applied Informatics](#)

Type
Written examination

Credits
4 CP

Grading
graded

Term offered
Each summer term

Version
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.

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 into account 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

Learning 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



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

6.12 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-101476 - Business Processes and Information Systems](#)**Type**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each summer term**Version**
1

Courses					
ST 2026	2511226	Applied Informatics - Mobile Computing	2 SWS	Lecture / 🗣️	Schiefer, Kruse
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, ✖ Canceled

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 Computing2511226, 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

6.13 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-101430 - Applied Informatics](#)

Type
Written examination

Credits
4 CP

Grading
graded

Term offered
Each winter term

Version
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)			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

2511030, WS 25/26, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
On-Site

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 aspects, 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 approaches for 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

**Exercises to Applied Informatics - Modelling**

2511031, WS 25/26, 1 SWS, Language: German, [Open in study portal](#)

**Practice (Ü)
On-Site**

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 aspects, 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 approaches for 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

6.14 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**
Examination of another type**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
1

Courses					
WT 25/26	2572187	B2B Sales Management	2 SWS	Lecture / 	Klarmann
WT 25/26	2572188	Exercices 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 Management2572187, 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

6.15 Module component: Bachelor's Thesis [T-INFO-109907]

Organisation: KIT Department of Informatics

Part of: [M-INFO-104875 - Bachelor's Thesis](#)

Type	Credits	Grading	Term offered	Version
Final Thesis	15 CP	graded	Each term	1

Final Thesis

This module component represents a final thesis. The following periods have been supplied:

Submission deadline	4 months
Maximum extension period	1 months
Correction period	6 weeks

T

6.16 Module component: Basic Notions of Computer Science [T-INFO-101964]

Coordinators: Dr. rer. nat. Torsten Ueckerdt
Dr. rer. nat. Mattias Ulbrich

Organisation: KIT Department of Informatics

Part of: [M-INFO-101170 - Basic Notions of Computer Science](#)

Type	Credits	Grading	Term offered	Version
Written examination	6 CP	Graded	Each winter term	1

Courses					
WT 25/26	2424001	Grundbegriffe der Informatik	3 SWS	Lecture / 	Ueckerdt
Exams					
WT 25/26	75400100	Basic Notions of Computer Science			Ueckerdt
ST 2026	75400100	Basic Notions of Computer Science			Ueckerdt

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.17 Module component: Basic Notions of Computer Science Pass [T-INFO-101965]

Coordinators: Dr. rer. nat. Torsten Ueckerdt
Dr. rer. nat. Mattias Ulbrich

Organisation: KIT Department of Informatics

Part of: [M-INFO-101170 - Basic Notions of Computer Science](#)

Type	Credits	Grading	Term offered	Version
Coursework	0 CP	pass/fail	Each winter term	1

Courses					
WT 25/26	2424002	Übungen zu Grundbegriffe der Informatik	1 SWS	Practice / 	Schneider, Ueckerdt, Merker
Exams					
WT 25/26	7500191	Basic Notions of Computer Science I Pass			Ueckerdt

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.18 Module component: Basic Practical Course for the ICPC-Programming Contest [T-INFO-101991]

Coordinators: TT-Prof. Dr. Thomas Bläsius
Miriam Goetze
Dr. rer. nat. Torsten Ueckerdt
Michael Zündorf

Organisation: KIT Department of Informatics

Part of: [M-INFO-101230 - Basic Practical Course for the ICPC-Programming Contest](#)

Type	Credits	Grading	Term offered	Version
Coursework	4 CP	pass/fail	Each summer term	2

Courses					
ST 2026	24872	Basispraktikum zum ICPC Programmierwettbewerb	6 SWS	Practical course / 	Zündorf, Ueckerdt, Goetze, Bläsius

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.19 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
see Annotations**Version**
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:

**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

Die Vorlesung wird im SoSe 2026 aufgrund eines Forschungssemesters nicht gelesen; Übung und Klausur finden statt.

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

**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

6.20 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
Written examination

Credits
4,5 CP

Grading
graded

Term offered
Each winter term

Version
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

6.21 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	Grading 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

6.22 Module component: Business Process Modelling [T-WIWI-102697]**Coordinators:** Prof. Dr. Andreas Oberweis**Organisation:** KIT Department of Business and Economics**Part of:** [M-WIWI-101438 - Semantic Knowledge Management](#)
[M-WIWI-101476 - Business Processes and Information Systems](#)**Type**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
2

Courses					
WT 25/26	2511210	Business Process Modelling	2 SWS	Lecture / 	Oberweis
WT 25/26	2511211	Exercise Business Process Modelling	1 SWS	Practice / 	Kruse
Exams					
WT 25/26	79AIFB_MvG_C2	Business Process Modelling (Registration extended until 16.02.2026)			Oberweis
ST 2026	791-AIFB-MvG-NK	Business Process Modelling (Registration until 20.07.2026)			Oberweis

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 in the first week after lecture period.

Prerequisites

None

Below you will find excerpts from courses related to this module component:

V

Business Process Modelling2511210, WS 25/26, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**
On-Site**Content**

The proper modeling of relevant aspects of business processes is essential for an efficient and effective design and implementation of processes. This lecture presents different classes of modeling languages and discusses the respective advantages and disadvantages of using actual application scenarios. For that simulative and analytical methods for process analysis are introduced. In the accompanying exercise the use of process modeling tools is practiced.

Learning objectives:

Students

- describe goals of business process modeling and apply different modeling languages,
- choose the appropriate modeling language according to a given context,
- use suitable tools for modeling business processes,
- apply methods for analysing and assessing process models to evaluate specific quality characteristics of the process model.

Recommendations:

Knowledge of course Applied Informatics I - Modelling is expected.

Workload:

- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h

Literature

- M. Weske: Business Process Management: Concepts, Languages, Architectures. Springer 2012.
- F. Schönthaler, G. Vossen, A. Oberweis, T. Karl: Business Processes for Business Communities: Modeling Languages, Methods, Tools. Springer 2012.

Weitere Literatur wird in der Vorlesung bekannt gegeben.

T

6.23 Module component: Civil Law for Beginners [T-INFO-103339]

Coordinators: Dr. Yvonne Matz

Organisation: KIT Department of Informatics

Part of: [M-INFO-101190 - Introduction to Civil Law](#)

Type
Written examination

Credits
5 CP

Grading
graded

Term offered
Each winter term

Version
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

6.24 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
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 Networks2561204, 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

6.25 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each summer term**Version**
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

Below you will find excerpts from courses related to this module component:

V

Computational Macroeconomics2500162, SS 2026, 2 SWS, Language: English, [Open in study portal](#)**Lecture (V)**
On-Site**Content**

Computational Macroeconomics combines macroeconomic theory with hands-on programming. The course provides you with both an analytical understanding of macroeconomic models and the tools needed to build and solve them.

At its core, the course introduces lifecycle and overlapping generations (OLG) models — a foundational framework for analyzing how different generations interact in the economy. These models are widely used in macroeconomic research to study questions such as the effect of demographic change on returns to capital or the design and reform of pension systems.

Alongside the economic theory, the course builds practical skills in numerical solution methods, with a focus on value function iteration. You will implement these methods directly in Python, bridging the gap between abstract economic modeling and working, executable code.

By the end of the course, you will be able to build and analyze OLG models from the ground up, apply value function iteration to solve quantitative economic models, and implement solution algorithms in Python.

This course is ideal preparation for writing a thesis at the Chair of Macroeconomics and for anyone looking to engage seriously with modern economic research.

T

6.26 Module component: Computer Architecture [T-INFO-101355]

Coordinators: Prof. Dr. Wolfgang Karl

Organisation: KIT Department of Informatics

Part of: [M-INFO-100818 - Computer Architecture](#)

Type	Credits	Grading	Term offered	Version
Written examination	6 CP	graded	Each summer term	1

Courses					
ST 2026	2424570	Computer Architecture	3 SWS	Lecture / 	Karl
Exams					
WT 25/26	7500034	Computer Architecture			Karl

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.27 Module component: Computer Graphics [T-INFO-101393]

Coordinators: Prof. Dr.-Ing. Carsten Dachsbacher

Organisation: KIT Department of Informatics

Part of: [M-INFO-100856 - Computer Graphics](#)

Type	Credits	Grading	Term offered	Version
Written examination	6 CP	Grading graded	Each winter term	1

Courses					
WT 25/26	2424081	Computergraphics	4 SWS	Lecture / 	Grauer, Dachsbacher
Exams					
WT 25/26	7500430	Computer Graphics			Dachsbacher

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

Success is assessed in the form of a written examination lasting 90 minutes in accordance with Section 4 (2) No. 1 SPO.

A grade bonus for first attempt examinations can be obtained by successfully completing exercises. 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. This bonus is only valid within one year for an examination in the same semester or in the following semester. After that, the grade bonus expires.

T

6.28 Module component: Computer Organization [T-INFO-103531]**Coordinators:** Prof. Dr. Wolfgang Karl**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-103179 - Computer Organization](#)

Type
Written examination

Credits
6 CP

Grading
graded

Version
1

Courses					
WT 25/26	2424502	Computer Organization	3 SWS	Lecture	Karl, Lehmann
WT 25/26	2424505	Übungen zu Rechnerorganisation	2 SWS	Practice	Lehmann
Exams					
WT 25/26	7500228	Computer Organization	Karl		

T

6.29 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

6.30 Module component: Database Systems [T-INFO-101497]

Coordinators: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: [M-INFO-104921 - Database Systems](#)

Type
Written examination

Credits
4 CP

Grading
graded

Term offered
Each summer term

Version
2

Courses					
ST 2026	24516	Datenbanksysteme	2 SWS	Lecture / 	Böhm, Reimann
ST 2026	24522	Übungen zu Datenbanksysteme	1 SWS	Practice / 	Böhm, Reimann
Exams					
WT 25/26	7500189	Database Systems			Böhm, Reimann
WT 25/26	7500379	Database Systems			Böhm, Reimann
ST 2026	7500166	Database Systems			Böhm, Neumann, Reimann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.31 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

6.32 Module component: Digital Circuits Design [T-INFO-103469]

Coordinators: Prof. Dr.-Ing. Uwe Hanebeck
Organisation: KIT Department of Informatics
Part of: [M-INFO-102978 - Digital Circuits Design](#)

Type
Written examination

Credits
6 CP

Grading
graded

Term offered
Each summer term

Version
1

Courses					
ST 2026	24007	Digital Circuits Design	3 SWS	Lecture / 	Tahoori
Exams					
WT 25/26	7500254	Digital Circuits Design			Tahoori
ST 2026	7500254	Digital Circuits Design			Tahoori

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.33 Module component: Digital Games [T-INFO-112750]

Coordinators: Prof. Dr. Kathrin Gerling
Organisation: KIT Department of Informatics
Part of: [M-INFO-106291 - Digital Games](#)

Type
Written examination

Credits
6 CP

Grading
graded

Term offered
Each summer term

Version
1

Courses					
ST 2026	2400162	Digital Games	4 SWS	Lecture / Practice / 	Gerling, Alexandrovsky
Exams					
WT 25/26	7500375	Digital Games			Gerling
ST 2026	7500055	Digital Games (Exam)			Gerling

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.34 Module component: Digital Games Pass [T-INFO-112751]

Coordinators: Prof. Dr. Kathrin Gerling
Organisation: KIT Department of Informatics
Part of: [M-INFO-106291 - Digital Games](#)

Type	Credits	Grading	Term offered	Version
Coursework	0 CP	pass/fail	Each summer term	1

Courses					
ST 2026	2400162	Digital Games	4 SWS	Lecture / Practice / 	Gerling, Alexandrovsky
Exams					
ST 2026	7500295	Digital Games			Gerling

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.35 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
Written examination

Credits
4,5 CP

Grading
graded

Term offered
Each winter term

Version
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

6.36 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each summer term**Version**
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 exercise. 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 Mechanisms2560550, SS 2026, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**
On-Site**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 Mechanisms2560551, SS 2026, 1 SWS, Language: German, [Open in study portal](#)**Practice (Ü)**
On-Site**Content**

See course description.

T

6.37 Module component: Digital Services: Foundations [T-WIWI-111307]

Coordinators: TT-Prof. Dr. Maximilian Förster
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
Written examination

Credits
4,5 CP

Grading
graded

Term offered
Each summer term

Version
3

Courses					
ST 2026	2595466	Digital Services: Foundations	2 SWS	Lecture / 	Förster, Holtmann
ST 2026	2595467	Exercise Digital Services: Foundations	1 SWS	Practice / 	Förster, Schäfer
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 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.

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

2595466, SS 2026, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)
On-Site

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.
- Böhmman, T., Leimeister, J. M., & Möslin, 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., Böhmman, 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.

T

6.38 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
Written examination

Credits
4,5 CP

Grading
graded

Term offered
Each winter term

Version
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)			Rau, Mill

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

6.39 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-101431 - Economics](#)

Type
Written examination

Credits
5 CP

Grading
graded

Term offered
Each winter term

Version
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

6.40 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	Grading 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.

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 Röhl (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

6.41 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
Written examination

Credits
3,5 CP

Grading
graded

Term offered
Each summer term

Version
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

6.42 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
Examination of another type

Credits
4,5 CP

Grading
graded

Term offered
Each winter term

Version
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 implementation 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

6.43 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**
Examination of another type**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
1

Courses					
WT 25/26	2545010	Entrepreneurship Basics (Track 1)	3 SWS	Seminar / 	Hirte
WT 25/26	2545011	Entrepreneurship Basics (Track 2)	3 SWS	Seminar / 	Lau
ST 2026	2545010	Entrepreneurship Basics (Track 1)	3 SWS	Seminar / 	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

**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.

**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.

T

6.44 Module component: Exercises in Civil Law [T-INFO-102013]**Coordinators:** Dr. Yvonne Matz**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101191 - Commercial Law](#)

Type
Examination of another type

Credits
9 CP

Grading
graded

Term offered
Each term

Version
3

Courses					
WT 25/26	2424011	Commercial and Corporate Law	2 SWS	Lecture / 	Danek
WT 25/26	2424017	Exercises in Civil Law	2 SWS	Lecture / 	Bress, Bosbach
ST 2026	24504	Advanced Civil Law	2 SWS	Lecture / 	Matz
ST 2026	24506	Exercises in Civil Law	2 SWS	Lecture / 	Sattler
ST 2026	24926	Case Studies in Civil Law	2 SWS	Practice / 	Bosbach
Exams					
WT 25/26	7500108	Commercial Law			Matz
ST 2026	7500093	Wirtschaftsprivatrecht			Sattler

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.45 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**
Examination of another type**Credits**
4,5 CP**Grading**
graded**Term offered**
Once**Version**
4

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

6.46 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-101421 - Supply Chain Management](#)
[M-WIWI-101936 - Methodical Foundations of OR](#)

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 successful completion of the online assessments.

Prerequisites

Prerequisite for admission to examination is the successful 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.iwr.kit.edu/Lehrveranstaltungen.php>.

Workload

135 hours

T

6.47 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
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 Firms2530242, 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

6.48 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

6.49 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

6.50 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
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 I2520022, 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 financial 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

6.51 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each summer term**Version**
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

6.52 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
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 Intermediation2530232, 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

6.53 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
Written examination

Credits
4,5 CP

Grading
graded

Term offered
Each summer term

Version
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

6.54 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 / 	Thimme
WT 25/26	2500219	FinTech (Exercise)	1 SWS	Practice / 	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

6.55 Module component: Formal Systems [T-INFO-101336]

Coordinators: Prof. Dr. Bernhard Beckert
Organisation: KIT Department of Informatics
Part of: [M-INFO-100799 - Formal Systems](#)

Type
Written examination

Credits
6 CP

Grading
graded

Term offered
Each winter term

Version
1

Courses					
WT 25/26	2424086	Formale Systeme	4 SWS	Lecture / Practice	Beckert, Ulbrich, Weigl
Exams					
WT 25/26	7500036	Formal Systems			Beckert
ST 2026	7500009	Formal Systems			Beckert

T

6.56 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 / 	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

2540560, SS 2026, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)
Blended (On-Site/Online)

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 as mental 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

6.57 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

6.58 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-101936 - Methodical Foundations of OR](#)

Type
Written examination

Credits
4,5 CP

Grading
graded

Term offered
Each summer term

Version
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

6.59 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-101936 - Methodical Foundations of OR](#)**Type**
Written examination**Credits**
9 CP**Grading**
graded**Term offered**
Each summer term**Version**
1

Courses					
ST 2026	2550134	Global Optimization I	2 SWS	Lecture / 	Stein
ST 2026	2550135	Exercise to Global Optimization I	1 SWS	Practice / 	Stein, Huber
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 I2550134, 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

**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

6.60 Module component: Global Optimization II [T-WIWI-102727]**Coordinators:** Prof. Dr. Oliver Stein**Organisation:** KIT Department of Business and Economics**Part of:** [M-WIWI-101936 - Methodical Foundations of OR](#)**Type**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each summer term**Version**
2

Courses					
ST 2026	2550136	Global Optimization II	2 SWS	Lecture / 	Stein
ST 2026	2550137	Exercise to Global Optimization II	1 SWS	Practice / 	Stein, Huber
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 II2550136, 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

6.61 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
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 AI2573005, WS 25/26, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**
On-Site

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.
- possesses 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

6.62 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each summer term**Version**
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 & Leadership2573001, 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

6.63 Module component: Human-Computer-Interaction [T-INFO-114192]

Coordinators: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: [M-INFO-107166 - Human Computer Interaction](#)

Type
Written examination

Credits
6 CP

Grading
graded

Term offered
Each summer term

Version
1

Courses					
ST 2026	24659	Human-Computer-Interaction	2 SWS	Lecture / 	Beigl
Exams					
WT 25/26	7500076	Human-Computer-Interaction			Beigl
ST 2026	7500048	Human-Computer-Interaction			Beigl

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is carried out as a written exam (of approx. 60 minutes) as a digital exam according to §2 (3) of the Statute for the implementation of online examinations. The exam takes place ON SITE at KIT!

Prerequisites

Participation in the exercise is compulsory and the contents of the exercise are relevant for the examination.

Below you will find excerpts from courses related to this module component:

V

Human-Computer-Interaction

24659, SS 2026, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)
Blended (On-Site/Online)

Content**Description:**

The lecture introduces the fundamentals of human-computer communication. Upon completion of the module, students will have acquired basic knowledge of the field of human-computer interaction. They will have mastered the basic techniques for evaluating user interfaces, will be familiar with the basic rules and techniques for designing user interfaces, and will have knowledge of existing user interfaces and their functions. They will be able to apply these basic techniques, for example, to analyze user interfaces of computer systems and synthesize existing designs into alternative, better solutions.

Course content:

Topics covered include:

1. Human perception (physiological basics, human senses, Gestalt)
2. Human information processing (HIP models, psychological basics, action processes)
3. Design basics and design methods, principles, guidelines, and standards for designing user interfaces
4. Design analysis of human-computer interaction
5. Fundamentals and examples for the design of user interfaces and methods for modeling user interfaces
6. Studies: Evaluation of human-computer interaction systems (tools, evaluation methods, performance measurement, study design and implementation)
7. Practical application of the above fundamentals using practical examples and development of independent, new, and alternative user interfaces.

Workload

The total workload for this learning unit is approximately 180 hours (6.0 credits).

Activity**Workload****Attendance time: Attendance at lectures**

15 x 90 min

22 h 30 min

Attendance time: Attendance at exercises

8 x 90 min

12 h 00 min

Preparation/follow-up for lectures

15 x 150 min

37 h 30 min

Preparation/follow-up for exercises

8 x 360 min

48 h 00 min

Reviewing the slide set/script 2 times

2 x 12 hours

24 hours

Preparing for the exam

36 hours

TOTAL

180 hours

Workload for the learning unit "Human-Machine Interaction"

Learning objectives

The lecture introduces the basics of human-machine communication. After completing the course, students will be able to

- demonstrate basic knowledge of the field of human-machine interaction
- name and apply basic techniques for analyzing user interfaces
- apply basic rules and techniques for designing user interfaces
- analyze and evaluate existing user interfaces and their functions

Language of instruction and language of examination:

The language of the lecture is English; exam questions are provided in English and German and may be answered in either English or German

Organizational issues

The lecture is a core module and is assessed in writing (written exam).

Literature

David Benyon: Designing Interactive Systems: A Comprehensive Guide to HCI and Interaction Design. Addison-Wesley Educational Publishers Inc; 2nd Revised edition; ISBN-13: 978-0321435330

Steven Heim: The Resonant Interface: HCI Foundations for Interaction Design. Addison Wesley; ISBN-13: 978-0321375964

T

6.64 Module component: Human-Computer-Interaction Pass [T-INFO-114193]**Coordinators:** Prof. Dr.-Ing. Michael Beigl**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-107166 - Human Computer Interaction](#)**Type**
Coursework**Credits**
0 CP**Grading**
pass/fail**Term offered**
Each summer term**Version**
1

Courses					
ST 2026	2400095	Human-Computer-Interaction	1 SWS	Practice / 	Beigl
Exams					
ST 2026	7500121	Human-Computer-Interaction Pass			Beigl

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

Exercise sheets must be handed in regularly to pass the course. The specific details will be announced in the lecture.

Prerequisites

None.

Additional Information

Participation in the exercise is compulsory and the contents of the exercise are relevant for the examination.

T

6.65 Module component: Humanoid Robots - Seminar [T-INFO-114170]

Coordinators: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: [M-INFO-107152 - Humanoid Robots - Seminar](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each winter term	1

Courses					
WT 25/26	2400048	Humanoid Robots - Seminar	2 SWS	Seminar / 	Asfour
Exams					
WT 25/26	7500119	Humanoid Robots - Seminar			Asfour

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). It includes a presentation at the end of the term and a term paper.

Prerequisites

None.

Recommendations

Attending the lectures Robotics I – Introduction to Robotics, Robotics II: Humanoid Robotics, Robotics III – Sensors and Perception in Robotics, Mechano-Informatics and Robotics and Wearable Robotic Technologies is recommended.

Below you will find excerpts from courses related to this module component:

V

Humanoid Robots - Seminar

2400048, WS 25/26, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)
On-Site

Content

The students choose a topic from the field of humanoid robotics, e.g. robot design, motion, perception, learning and conduct a mostly independent literature research on that topic with the support of an experienced supervisor. At the end of the semester they present their results and write a paper in English in the style of a scientific publication.

Learning Objectives:

The students have gained experience in doing independent literature research on a topic of ongoing research. They have studied, understood and compared different approaches tackling the selected scientific problem. The students are able to write a survey of the different approaches in English and in the style of a scientific publication, and to give a talk on the chosen topic.

Examination: Oral presentation at the end of the semester, and a written paper.

Registration ILIAS

Contact: humanoid-robotics-seminar@lists.kit.edu

Distribution of topics at the beginning of the lecture time

Organizational issues**Zugehörige Veranstaltungen:**

Empfehlungen:

- Vorlesung Anthropomatik: Humanoide Roboter
- Praktikum Humanoide Roboter
- Robotik 1, Robotik 2, Robotik 3
- Maschinelles Lernen
- Visuelle Perzeption für Mensch-Maschine-Schnittstellen

Arbeitsaufwand: 90 h

T

6.66 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

6.67 Module component: Information Security [T-INFO-112195]

Coordinators: Prof. Dr. Hannes Hartenstein
Prof. Dr. Thorsten Strufe

Organisation: KIT Department of Informatics

Part of: [M-INFO-106015 - Information Security](#)
[M-WIWI-107688 - Information Security: Theory and Practice](#)

Type
Written examination

Credits
5 CP

Grading
graded

Term offered
Each summer term

Version
6

Courses					
ST 2026	2400199	Informationssicherheit	3 SWS	Lecture / Practice / 	Müller-Quade, Strufe, Hartenstein
Exams					
WT 25/26	7500003	Information Security			Wressnegger, Müller-Quade, Strufe, Hartenstein
WT 25/26	7500408	Information Security			Strufe, Hartenstein
ST 2026	7500028	Information Security			Müller-Quade, Strufe, Hartenstein

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Modeled Prerequisites

The following conditions have to be fulfilled:

1. The module component [T-INFO-101371 - Security](#) must not have been started.

T

6.68 Module component: Information Systems 1 [T-WIWI-109817]

Coordinators: Prof. Dr. Alexander Mädche
Prof. Dr. Jella Pfeiffer

Organisation: KIT Department of Business and Economics

Part of: [M-WIWI-104820 - Information Systems I](#)
[M-WIWI-104843 - Orientation Exam](#)

Type	Credits	Grading	Term offered	Version
Written examination	4 CP	Graded	Each winter term	2

Courses					
WT 25/26	2500034	Tutorial for Information Systems I	2 SWS	Tutorial / 	Mädche, Abeck
WT 25/26	2540425	Information Systems I	2 SWS	Lecture / 	Mädche, Weinhardt, Seitz Sängler
Exams					
WT 25/26	7900103	Information Systems 1			Mädche
ST 2026	7900279	Information Systems 1			Mädche

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is monitored in the form of a written test (60 minutes) at the end of the lecture period. By successful processing the exercises a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Prerequisites

None

Recommendations

None

Workload

120 hours

Below you will find excerpts from courses related to this module component:

V

Information Systems I

2540425, WS 25/26, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Blended (On-Site/Online)

Content

In the lecture Information Systems I of the module central basics of information systems are introduced as a scientific discipline. For this purpose, the objects of knowledge, basic terms, scientific character and goals as well as methods in science and practice of information systems are introduced. Concepts, methods and theories as well as systems and their technical design are discussed along the analysis units individual, group, organization and market. The lecture focuses on the analysis units individual and group.

Learning objectives:

The students

- can describe the subject area of the discipline information systems in science and practice
- know the central terms as well as goals, core tasks and objects of knowledge of information systems
- understand the interplay of subject area, method and theory in information systems
- can define the central analysis units individual, group, organisation and market and obtain a basic understanding of the targeted use of information systems and infrastructures
- develop an understanding of the importance of interdisciplinary, systemic thinking and develop in a team a solution to a real social problem

Workload:

Total effort for 4 credit points: approx. 120 hours. Presence time: 40 hours Preparation/postprocessing: 40 hours Examination and exam preparation: 40 hours

T

6.69 Module component: Information Systems 2 [T-WIWI-109818]**Coordinators:** Prof. Dr. Jella Pfeiffer**Organisation:** KIT Department of Business and Economics**Part of:** [M-WIWI-104821 - Information Systems II](#)**Type**
Written examination**Credits**
4 CP**Grading**
graded**Term offered**
Each summer term**Version**
1

Courses					
ST 2026	2540450	Information Systems 2	2 SWS	Lecture / 	Pfeiffer, Förster
ST 2026	2540451	Tutorium zu Wirtschaftsinformatik 2	2 SWS	Tutorial / 	Pfeiffer, Schlaich, Bennardo
Exams					
WT 25/26	7900192	Information Systems 2 (Nachklausur)			Pfeiffer, Weinhardt
WT 25/26	7900220	Information Systems 2			Weinhardt
ST 2026	7900325	Information Systems 2			Pfeiffer, Weinhardt

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

None

Additional Information

New course starting summer term 2020.

Workload

120 hours

T

6.70 Module component: Intellectual Property and Data Protection [T-INFO-109840]**Coordinators:** N.N.**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101253 - Intellectual Property and Data Protection](#)**Type**
Written examination**Credits**
6 CP**Grading**
graded**Term offered**
Each winter term**Version**
1

Courses					
WT 25/26	2424018	Datenschutzrecht	2 SWS	Lecture / 	Schneider, Werner
WT 25/26	2424070	Industrial Property and Copyright Law	2 SWS	Lecture / 	Hartmann
Exams					
WT 25/26	7500236	Intellectual Property and Data Protection			Zufall, Matz
ST 2026	7500299	Intellectual Property and Data Protection			Sattler, Zufall

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.71 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
Written examination

Credits
3 CP

Grading
graded

Term offered
see Annotations

Version
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

6.72 Module component: Introduction in Computer Networks [T-INFO-102015]**Coordinators:** Prof. Dr. Martina Zitterbart**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-103455 - Introduction in Computer Networks](#)**Type**
Written examination**Credits**
4 CP**Grading**
graded**Term offered**
Each summer term**Version**
1

Courses					
ST 2026	2424519	Einführung in Rechnernetze	2 SWS	Lecture / 	Hildenbrand, Krack, Neumeister, Zitterbart
ST 2026	2424521	Übung zu Einführung in Rechnernetze	1 SWS	Practice / 	Hildenbrand, Krack, Neumeister, Zitterbart
Exams					
WT 25/26	7500201	Introduction to Computer Networking	Zitterbart		
ST 2026	7500116	Introduction to Computer Networking	Zitterbart		

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.73 Module component: Introduction to Artificial Intelligence [T-INFO-112194]

Coordinators: Prof. Dr. Pascal Friederich
Prof. Dr. Gerhard Neumann

Organisation: KIT Department of Informatics

Part of: [M-INFO-106014 - Introduction to Artificial Intelligence](#)

Type
Written examination

Credits
5 CP

Grading
graded

Term offered
Each winter term

Version
7

Courses					
WT 25/26	2400158	Introduction to Artificial Intelligence	3 SWS	Lecture / Practice / 	Schäfer, Nowack, Friederich, Neumann
Exams					
WT 25/26	7500136	Introduction to Artificial Intelligence			Nowack, Friederich, Schäfer, Neumann
ST 2026	7500058	Introduction to Artificial Intelligence			Friederich, Schäfer, Nowack

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.74 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
Written examination

Credits
5 CP

Grading
graded

Term offered
Each summer term

Version
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

6.75 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
Written examination

Credits
5,5 CP

Grading
graded

Term offered
Each summer term

Version
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

6.76 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-105267 - Business Administration](#)

Type
Written examination

Credits
5 CP

Grading
graded

Term offered
Each summer term

Version
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, Timme
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 Materialien zur Vorlesung gegeben.

T

6.77 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
Written examination

Credits
4,5 CP

Grading
graded

Term offered
Each summer term

Version
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

6.78 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

6.79 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each summer term**Expansion**
1 semesters**Version**
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	Bell
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

2540541, SS 2026, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)**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

6.80 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
Written examination

Credits
9 CP

Grading
graded

Term offered
see Annotations

Version
2

Courses					
WT 25/26	2500030	Computer Exercises on Introduction to Operations Research II	1 SWS	Tutorial / 	Dunke
WT 25/26	2530043	Introduction to Operations Research II	2 SWS	Lecture / 	Stein
WT 25/26	2530044		2 SWS	Tutorial / 	Dunke
ST 2026	2500008	Computer Exercises on Introduction to Operations Research I	1 SWS	Tutorial / 	Dunke
ST 2026	2550040	Introduction to Operations Research I	2 SWS	Lecture / 	Rebennack
ST 2026	2550043	Tutorials on Introduction to Operations Research I	2 SWS	Tutorial / 	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 course Introduction to Operations Research II

[2530043].

Workload

270 hours

Below you will find excerpts from courses related to this module component:

V

Introduction to Operations Research 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

**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

6.81 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 / 	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

6.82 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-103278 - Optimization under Uncertainty](#)**Type**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each summer term**Version**
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

6.83 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
Written examination

Credits
4,5 CP

Grading
graded

Term offered
Each summer term

Version
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

2530575, SS 2026, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
On-Site

Literature**Weiterführende Literatur:**

Bodie/Kane/Marcus (2010): Essentials of Investments, 8. Aufl., McGraw-Hill Irwin, Boston

T

6.84 Module component: Lab Protocol Engineering [T-INFO-102066]

Coordinators: Prof. Dr. Martina Zitterbart
Organisation: KIT Department of Informatics
Part of: [M-INFO-101247 - Lab Protocol Engineering](#)

Type
Examination of another type

Credits
4 CP

Grading
graded

Term offered
Each winter term

Version
3

Courses					
WT 25/26	2400107	Basispraktikum Protocol Engineering	4 SWS	Practical course	Zitterbart, König, Mahrt
Exams					
WT 25/26	7500023	Lab Protocol Engineering			Zitterbart

T

6.85 Module component: Lab: Working with Database Systems [T-INFO-103552]**Coordinators:** Prof. Dr.-Ing. Klemens Böhm**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101865 - Lab: Working with Database Systems](#)**Type**
Coursework**Credits**
4 CP**Grading**
pass/fail**Term offered**
Each winter term**Version**
2

Courses					
WT 25/26	2424317	Arbeiten mit Datenbanksystemen	2 SWS	Practical course / 	Böhm, Richter
ST 2026	2424317	Arbeiten mit Datenbanksystemen	2 SWS	Practical course / 	Böhm, Richter, Reimann
Exams					
WT 25/26	7500146	Lab: Working with Database Systems			Böhm
ST 2026	7500024	Lab: Working with Database Systems			Böhm

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.86 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.

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

6.87 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**6.88 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

6.89 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-105267 - Business Administration](#)

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 Materialien zur Vorlesung gegeben.

T

6.90 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
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 Organizations2577902, 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

6.91 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	Grading 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

6.92 Module component: MARS Basis Lab [T-INFO-102053]

Coordinators: Prof. Dr.-Ing. Carsten Dachsbacher

Organisation: KIT Department of Informatics

Part of: [M-INFO-101245 - MARS-Based Internship](#)

Type
Examination of another type

Credits
4 CP

Grading
graded

Version
1

Courses					
WT 25/26	2400224	MARS-practical course	2 SWS	Practical course / 	Hoffmann, Dachsbacher
Exams					
WT 25/26	7500321	MARS Basis Lab			Dachsbacher

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T**6.93 Module component: Mathematics I for Information Systems - Exam [T-MATH-109942]**

Coordinators: Prof. Dr. Andreas Rieder
 Dr. Daniel Weiß
 Prof. Dr. Christian Wieners

Organisation: KIT Department of Mathematics

Part of: [M-MATH-104914 - Mathematics I](#)
[M-WIWI-104843 - Orientation Exam](#)

Type
 Written examination

Credits
 7 CP

Grading
 graded

Term offered
 Each term

Version
 1

Courses					
WT 25/26	0136000	Mathematik I für die Fachrichtungen Wirtschaftsinformatik und Digital Economics	4 SWS	Lecture / 	Weiß
Exams					
WT 25/26	7700054	Mathematics I for Information Systems - Exam			Weiß
ST 2026	7700072	Mathematics I for Information Systems - Exam			Weiß

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Additional Information

This exam is part of the orientation exam.

T**6.94 Module component: Mathematics I for Information Systems - Exercise [T-MATH-109943]**

Coordinators: Prof. Dr. Andreas Rieder
 Dr. Daniel Weiß
 Prof. Dr. Christian Wieners

Organisation: KIT Department of Mathematics

Part of: [M-MATH-104914 - Mathematics I](#)
[M-WIWI-104843 - Orientation Exam](#)

Type	Credits	Grading	Term offered	Version
Coursework	1 CP	pass/fail	Each winter term	2

Courses					
WT 25/26	0136000	Mathematik I für die Fachrichtungen Wirtschaftsinformatik und Digital Economics	4 SWS	Lecture / 	Weiß
Exams					
WT 25/26	7700053	Mathematics I for Information Systems - Exercise			Weiß

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Additional Information

This exam is part of the orientation exam.

T**6.95 Module component: Mathematics II for Information Systems - Exam [T-MATH-109944]**

Coordinators: Prof. Dr. Andreas Rieder
 Dr. Daniel Weiß
 Prof. Dr. Christian Wieners

Organisation: KIT Department of Mathematics

Part of: [M-MATH-104915 - Mathematics II](#)

Type
 Written examination

Credits
 7 CP

Grading
 graded

Term offered
 Each term

Version
 1

Courses					
ST 2026	0187700	Mathematik II für Wirtschaftsinformatik und Digital Economics	4 SWS	Lecture	Weiß
Exams					
WT 25/26	7700044	Mathematics II for Information Systems - Exam			Weiß
ST 2026	7700021	Mathematics II for Information Systems - Exam			Weiß

T

6.96 Module component: Mathematics II for Information Systems - Exercise [T-MATH-109945]

Coordinators:

Prof. Dr. Andreas Rieder
Dr. Daniel Weiß
Prof. Dr. Christian Wieners

Organisation:

KIT Department of Mathematics

Part of:

M-MATH-104915 - Mathematics II

Type	Credits	Grading	Term offered	Version
Coursework	1 CP	pass/fail	Each summer term	2

Exams			
ST 2026	7700093	Mathematics II for Information Systems - Exercise	Weiß

T

6.97 Module component: Mechano-Informatics and Robotics [T-INFO-101294]

Coordinators: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: [M-INFO-100757 - Mechano-Informatics and Robotics](#)

Type
Written examination

Credits
4 CP

Grading
graded

Term offered
Each winter term

Version
1

Courses					
WT 25/26	2400077	Mechano-Informatics and Robotics	2 SWS	Lecture / 	Asfour
Exams					
WT 25/26	7500176	Mechano-Informatics and Robotics			Asfour
ST 2026	7500217	Mechano-Informatics and Robotics			Asfour

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is carried out as a written examination (§ 4 Abs. 2 No. 1 SPO) lasting 60 minutes.

Prerequisites

None.

Recommendations

Basispraktikum Mobile Roboter

Below you will find excerpts from courses related to this module component:

V

Mechano-Informatics and Robotics

2400077, WS 25/26, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)
On-Site

Content

The lecture addresses various engineering and algorithmic aspects and topics in robotics which are illustrated and explained based on examples originating from current research conducted in the field of humanoid robotics. First, this lecture gives an introduction into the mathematical fundamentals which are needed to describe a robotic system as well as the basic algorithms commonly applied in motion planning.

Subsequently, models and methods are introduced with which dynamical systems can be formalized and which can be used to encode and represent robot actions. To do so, we will discuss linear time-invariant systems in state.

Learning Objectives:

Based on the example of robotics students understand the synergistic effects and interdisciplinarity of mechatronics and informatics, the embedded systems, the control, and the methods and the algorithms. They are acquainted with the basic terminology and the methods which are common in robotics, signal processing, action representation, machine learning and cognitive systems. They are capable of applying fundamental state-of-the-art methods and tools for the development and programming of robots. Based on

examples originating from current research conducted in the fields of humanoid robotics, the students interactively learn how to identify and formalize problems and tasks and how to develop solutions in an analytical and goal-directed way.

Organizational issues

Associated courses: Recommendation - Basispraktikum Mobile Roboter

The assessment is carried out as a written examination (§ 4 Abs. 2 No. 1 SPO) usually lasting 60 minutes.

Workload:

2h attendance

+ 2*2h = 4h preparation/follow-up work

+ 30h exam preparation

120h

T

6.98 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

6.99 Module component: Microprocessors I [T-INFO-101972]

Coordinators: Prof. Dr. Wolfgang Karl

Organisation: KIT Department of Informatics

Part of: [M-INFO-101183 - Microprocessors I](#)

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	Graded	Each summer term	2

Courses					
ST 2026	2424688	Microprocessors I	2 SWS	Lecture / 	Karl
Exams					
WT 25/26	7500382	Microprocessors I			Karl

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.100 Module component: Mobile Computing and Internet of Things [T-INFO-102061]**Coordinators:** Prof. Dr.-Ing. Michael Beigl**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101249 - Mobile Computing and Internet of Things](#)**Type**
Written examination**Credits**
2,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
7

Courses					
WT 25/26	2400051	Mobile Computing and Internet of Things		Lecture / Practice	Beigl, Röddiger
Exams					
WT 25/26	7500287_1	Mobile Computing and Internet of Things			Beigl
ST 2026	7500350	Mobile Computing and Internet of Things			Beigl

Assessment

The assessment is carried out as a written exam (of approx. 60 minutes) as a digital exam according to §2 (3) of the Statute for the implementation of online examinations. The exam takes place ON SITE at KIT!

Prerequisites

Exercise certificate must be submitted.

T**6.101 Module component: Mobile Computing and Internet of Things - Exercise [T-INFO-113119]****Coordinators:** Prof. Dr.-Ing. Michael Beigl**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101249 - Mobile Computing and Internet of Things](#)**Type**
Examination of another type**Credits**
2,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
4

Courses					
WT 25/26	2400051	Mobile Computing and Internet of Things		Lecture / Practice	Beigl, Röddiger
Exams					
WT 25/26	7500358	Mobile Computing and Internet of Things			Beigl

Additional Information

Exercise certificate can only be credited in combination with the exam([T-INFO-102061 - Mobile Computing and Internet of Things](#)). This part of the course cannot be taken individually.

T

6.102 Module component: Mobile Robots – Practical Course [T-INFO-101992]

Coordinators: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: [M-INFO-101184 - Mobile Robots – Practical Course](#)

Type	Credits	Grading	Term offered	Version
Coursework	4 CP	pass/fail	Each summer term	2

Courses					
ST 2026	24624	Mobile Robots - Practical Course	4 SWS	Practical course /	Asfour
Exams					
ST 2026	7500264	Mobile Robots – Practical Course			Asfour

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment

The assessment takes the form of a different type of examination in accordance with Section 4 (2) No. 3 SPO and consists of several exercises. The assessment is based on the grades “pass” / “fail.”

Prerequisites

Knowledge of the C programming language and technical computer science is required.

Recommendations

Knowledge of the C programming language and technical computer science is required.

Below you will find excerpts from courses related to this module component:

V

Mobile Robots - Practical Course

24624, SS 2026, 4 SWS, Language: German, [Open in study portal](#)

Practical course (P)
On-Site

Content

During the practical course, ARMURO robots are assembled. Each student receives the components for their own robot and assembles it independently under supervision before putting it into operation. At the beginning, theoretical basics on electronic components, safety instructions, and soldering exercises are taught. Thereafter, the step-by-step assembly of the robot, initial operation and system tests are performed. This is followed by weekly exercises introducing microcontroller programming in C and explaining how to set up the development environment. Building on this, sensors and motors are calibrated and controlled, and reactive behavior patterns such as line tracking or obstacle avoidance are implemented. In the final phase, modules are integrated, tested, and optimized. The practical course ends with a final race in which the robots must complete an obstacle course.

Learning Objectives:

Students can understand circuit diagrams and can assemble, test and debug complex PCBs. They are familiar with programming microcontroller-based embedded systems using the C language and cross compilers. The student can use methods for controlling robotic sensors and actuators, can conduct experiments with robots and solve tasks in this context independently and in small groups.

Organizational issues

Die Erfolgskontrolle erfolgt nach § 4 Abs. 2 Nr. 3 SPO als Erfolgskontrolle anderer Art und besteht aus mehreren Teilaufgaben. Die Bewertung erfolgt mit den Noten “bestanden” / “nicht bestanden”.

Voraussetzungen:

Kenntnisse in der Programmiersprache C und in der Technischen Informatik werden vorausgesetzt.

Arbeitsaufwand:

120 h

- ca. 15 * 4 h = 60 h Präsenzzeit
- ca. 15 * 3 h = 45 h Vor- und Nachbereitungszeit
- ca. 15 h Prüfungsvorbereitung und Präsenz in Prüfung

T

6.103 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each summer term**Version**
4

Courses					
ST 2026	2550490	Modellieren und OR-Software: Einführung	3 SWS	Practical course / 	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>.

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.

T

6.104 Module component: Motion in Human and Machine - Seminar [T-INFO-105140]

Coordinators: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: [M-INFO-102555 - Motion in Human and Machine - Seminar](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	Graded	Each summer term	3

Courses					
ST 2026	2400063	Motion in Human and Machine	3 SWS	Seminar / 	Asfour
Exams					
ST 2026	7500289	Motion in Man and Machine - Seminar			Asfour

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). It includes a report of about two pages and a video presentation of about five minutes.

Prerequisites

None.

Recommendations

Programming skills in C++, Python or Matlab are recommended.

Attendance of the lectures Robotics I – Introduction to Robotics, Robotics II – Humanoid Robotics, Robotics III – Sensors and Perception in Robotics, Mechano-Informatics and Robotics and Wearable Robot Technologies is recommended

Additional Information

This interdisciplinary seminar is conducted in cooperation with the University of Stuttgart and the University of Tübingen.

Below you will find excerpts from courses related to this module component:

V

Motion in Human and Machine

2400063, SS 2026, 3 SWS, Language: English, [Open in study portal](#)

Seminar (S)
On-Site

Content

This interdisciplinary block seminar addresses methods for modeling, generating, and controlling movements in human and robot systems. Students gain insight into this interdisciplinary field, learning fundamentals of capturing biological motion, biomechanical simulation, robotics, and machine learning.

The seminar begins with the generation of human movement as an effect of muscle contraction. It covers how observed movement patterns can be identified and categorized. Methods for learning movement primitives from human demonstrations are presented, including approaches for reproducing these patterns on humanoid robots. The seminar addresses the challenge of mapping human motion to robots with different kinematics and dynamics. Students learn how motion primitives enable transfer of human movements to robotic systems and their application to motion generation in humanoid robots.

Students work in small groups on collaborative projects that apply the learned methods. These projects allow students to deepen their understanding through practical application of the methods.

Competency Goals:

Students understand methods for modeling, processing, and analyzing human motions. They can explain approaches for capturing biological motion and biomechanical simulation.

Students can describe methods for learning motion primitives from human demonstrations and understand how human motion is mapped to robots with different kinematics and dynamics. They can apply these methods in new contexts.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

Organizational issues**Institutions:**

KIT IAR - H²T Prof. T. Asfour, University of Stuttgart, University of Tübingen

This interdisciplinary seminar is conducted in cooperation with the University of Stuttgart and the University of Tübingen.

Competency certificate:

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). It includes a report of about two pages and a video presentation of about five minutes.

Recommendations:

Programming skills in C++, Python or Matlab are recommended.

Attendance of the lectures *Robotics I – Introduction to Robotics*, *Robotics II – Humanoid Robotics*, *Robotics III – Sensors and Perception in Robotics*, *Mechano-Informatics and Robotics* and *Wearable Robot Technologies* is recommended.

Workload:

90 h

- approx. 30 h attendance time
- approx. 15 h group project
- approx. 20 h literature review
- approx. 20 h written paper
- approx. 5 h preparation of video podcast

T

6.105 Module component: Nonlinear Optimization I [T-WIWI-102724]**Coordinators:** Prof. Dr. Oliver Stein**Organisation:** KIT Department of Business and Economics**Part of:** [M-WIWI-101936 - Methodical Foundations of OR](#)
[M-WIWI-103278 - Optimization under Uncertainty](#)**Type**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
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 I2550111, 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 conditions
- 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

6.106 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-101936 - Methodical Foundations of OR](#)**Type**
Written examination**Credits**
9 CP**Grading**
graded**Term offered**
Each winter term**Version**
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 consists 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 conditions
- 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

**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

6.107 Module component: Nonlinear Optimization II [T-WIWI-102725]**Coordinators:** Prof. Dr. Oliver Stein**Organisation:** KIT Department of Business and Economics**Part of:** [M-WIWI-101936 - Methodical Foundations of OR](#)**Type**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
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 consists 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

6.108 Module component: Operating Systems [T-INFO-101969]

Coordinators: Prof. Dr.-Ing. Frank Bellosa
Organisation: KIT Department of Informatics
Part of: [M-INFO-101177 - Operating Systems](#)

Type
Written examination

Credits
6 CP

Grading
graded

Term offered
Each winter term

Version
2

Courses					
WT 25/26	2424009	Operating Systems	4 SWS	Lecture / 	Bellosa, Habicht, Maucher, Werling
Exams					
WT 25/26	7500069	Operating Systems			Bellosa
ST 2026	7500095	Operating Systems			Bellosa

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Below you will find excerpts from courses related to this module component:

V

Operating Systems

2424009, WS 25/26, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)
On-Site

Literature

Operating Systems: Three Easy Pieces, Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau, Online Textbook

Modern Operating Systems, Andrew S. Tanenbaum, Herbert Bos, 4th Edition

Operating System Concepts, Abraham Silberschatz, 9th Edition

T

6.109 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
3

Courses					
WT 25/26	2550464	Optimization Under Uncertainty	2 SWS	Lecture / 	Rebennack, Kandora
WT 25/26	2550465	Übungen zu Optimierungsansätze unter Unsicherheit	1 SWS	Practice / 	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

6.110 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
Examination of another type

Credits
4,5 CP

Grading
graded

Term offered
Each winter term

Version
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
ST 2026	7900266	Platform Economy			Weinhardt

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 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 Souveränität“ (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**6.111 Module component: Practical Course Computer Engineering: Hardware Design [T-INFO-102011]**

Coordinators: Mohamed Hussein Hussein Aly Alsharkawy
Zeynep Gülbeyaz Demirdag
Dr.-Ing. Hassan Amr Adel Nassar

Organisation: KIT Department of Informatics

Part of: [M-INFO-101219 - Practical Course Computer Engineering: Hardware Design](#)

Type
Examination of another type

Credits
4 CP

Grading
graded

Term offered
Each winter term

Version
1

Courses					
WT 25/26	2424309	Basispraktikum TI: Hardware-related System Design	4 SWS	Practical course	Nassar, Demirdag, Alsharkawy, Henkel
Exams					
WT 25/26	7500037	Lab Course: Hardware-Aware System Design			Henkel

Assessment

Success is assessed in the form of a different type of examination in accordance with Section 4 (2) No. 3 SPO. A written paper must be prepared and a presentation given. Withdrawal is possible within two weeks of the topic being assigned.

Prerequisites

None.

Recommendations

Attendance at events:

- Computer organization

and/or

-Digital technology and design methods

Below you will find excerpts from courses related to this module component:

V**Basispraktikum TI: Hardware-related System Design**

2424309, WS 25/26, 4 SWS, Language: English, [Open in study portal](#)

Practical course (P)

Content

Overview: This lab aims at providing the students with the practical concepts of designing digital hardware systems.

- It provides an overview of the design process, starting from very simple circuits to the design of processors with prototyping on FPGAs and using HDL languages
- It covers the main design and implementation issues for digital devices and their applications. These issues challenge the students to make design decisions to optimize the designed hardware under constrained resources.
- The students gain in-depth practical experiences in digital system design with a focus on hardware development and implementing custom peripheral, e.g., display interface and input buttons, for processors
- Students experience the process of High-Level Synthesis where software descriptions (for instance in C) are (semi-)automatically transformed to hardware

Lab's Goals:

- Introducing the students to hardware design
- Familiarizing the students with the challenges faced in hardware design, e.g., glitches, timing violations, etc.
- The students shall be able to implement and design custom useful and interesting hardware and they shall be able to develop/use debug interfaces to check for errors

Target Audience:

- This lab is suitable for electrical engineering and informatics students and those who have an interest in digital systems design and digital techniques

Prerequisites:

- The ability to develop simple software programs in C is recommended.
- Basic knowledge about other programming languages can be helpful (e.g., Java or Python)
- No previous knowledge of FPGA or HDL programming needed!
- Attending the TI lecture, to understand

Details:

- The lab manuals and exercises are conducted **only in English**.
- The lab is split into weekly sessions throughout the semester. Each session is approximately 3-4 hours per week. At the end of the semester, there will be a final project.
- State-of-the-art FPGA-based MPSoCs and FPGA design software are used in the lab, i.e., the Blackboard FPGA development board and the Vivado 2022.2 software

T**6.112 Module component: Practical Course Web Applications and Service-Oriented Architectures (I) [T-INFO-103119]****Coordinators:** Prof. Dr. Sebastian Abeck**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101633 - Practical Course Web Applications and Service-Oriented Architectures \(I\)](#)**Type**
Examination of another type**Credits**
5 CP**Grading**
graded**Term offered**
Each winter term**Version**
2

Courses					
WT 25/26	2424312	Basispraktikum Microservice2Go (I)	2 SWS	Practical course / 	Abeck, Schneider
Exams					
WT 25/26	7500029	Practical Course Web Applications and Service-oriented Architectures (I)			Abeck

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.113 Module component: Practical Course: Lego Mindstorms [T-INFO-107502]

Coordinators: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: [M-INFO-102557 - Lego Mindstorms - Practical Course](#)

Type	Credits	Grading	Term offered	Version
Coursework	4 CP	pass/fail	Each winter term	1

Courses					
WT 25/26	2424306	Lego Mindstorms - Laboratory	3 SWS	Practical course /	Asfour
Exams					
WT 25/26	7500179	Lego Mindstorms - Practical Course			Asfour

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Prerequisites

None.

Recommendations

Basic knowledge in Python is necessary for successful completion of this course.

Below you will find excerpts from courses related to this module component:

V

Lego Mindstorms - Laboratory

2424306, WS 25/26, 3 SWS, Language: German, [Open in study portal](#)

Practical course (P)
On-Site

Content

In this practical course, teams of three students build and program a mobile robot using Lego Mindstorms and the MicroPython programming language. The robots are challenged to complete a versatile parkour including sections like the traversal of a maze, following a line, crossing a bridge or avoiding obstacle. After initial building of the robots, a section of the parkour will be set up each week and tackled by the robots, for which the students have to prepare their code beforehand. A final race of the robots on the entire parkour will be held at the end of the semester.

Learning Objectives:

The participants are able to design and construct a robot with motors and sensors using the Lego Mindstorms kit. The students are familiar with programming the Lego EV3 components using the Python programming language. They are able to understand and solve several key problems in mobile robotics, such as autonomous navigation, detection of landmarks and objects as well as obstacle avoidance. The students know how to efficiently and independently solve problems in a small group in a given time frame and are able to systematically document their work and results.

Organizational issues

Das Praktikum findet wöchentlich statt.

Nachweis: Die Erfolgskontrolle wird in der Modulbeschreibung erläutert.

Empfehlung:

Grundlegende Kenntnisse in Python sind hilfreich, aber nicht zwingend erforderlich. / Basic knowledge in Python is helpful but not required.

Arbeitsaufwand: 120 h

Beschreibung:

Die Aufgabenstellungen des Praktikums reichen von Aufbau und Programmierung der Lego EV3-Bausteine mit der Programmiersprache Python bis hin zur Lösung spezieller Aufgaben, die im Rahmen eines abschließenden Wettrennens zu lösen sind (Linien folgen, Hindernissen ausweichen, Bahnplanung).

Literature

Wird in der Veranstaltung bekannt gegeben.

T**6.114 Module component: Practical Course: Managing Scientific Data [T-INFO-112809]****Coordinators:** Prof. Dr.-Ing. Klemens Böhm**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-106311 - Practical Course: Managing Scientific Data](#)

Type	Credits	Grading	Term offered	Version
Coursework	4 CP	pass/fail	Irregular	1

T

6.115 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

6.116 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**
Examination of another type**Credits**
4,5 CP**Grading**
graded**Term offered**
Each term**Version**
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 Healthcare2500073, 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 facilitator 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



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>

T**6.117 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

6.118 Module component: Process Mining [T-WIWI-109799]**Coordinators:** Dr.-Ing. Clemens Schreiber**Organisation:** KIT Department of Business and Economics**Part of:** [M-WIWI-101476 - Business Processes and Information Systems](#)**Type**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each summer term**Version**
2

Courses					
ST 2026	2511204	Process Mining	2 SWS	Lecture / 	Schreiber
ST 2026	2511205	Exercise Process Mining	1 SWS	Practice / 	Rybinski
Exams					
WT 25/26	79AIFB_PM_A5	Process Mining (Registration extended until 16.02.2026)			Oberweis
ST 2026	791-AIFB-PM-HK	Process Mining (Registration until 20.07.2026)			Schreiber

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 in the first week after lecture period.

Prerequisites

None

Additional Information

Former name (up to winter semester 2018/1019) "Workflow Management".

Below you will find excerpts from courses related to this module component:

V

Process Mining2511204, SS 2026, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**
On-Site

Content

The area of process mining covers approaches which aim at deducting new knowledge on the basis of logfiles generated by information systems. Such information systems are e.g., workflow-management-systems which are used for an efficient control of processes in enterprises and organisations. The lecture introduces the foundations of processes and respective modeling and analysis techniques. In the following, the foundations of process mining and the three classical types of approaches - discovery, conformance and enhancement - will be taught. In addition to the theoretical basics, tools, application scenarios in practice and open research questions are covered as well.

Learning objectives:

Students

- understand the concepts and approaches of process mining and know how they are applied,
- create and evaluate business process models,
- analyze static and dynamic properties of workflows,
- apply approaches and tools of process mining.

Recommendations:

Knowledge of course Applied Informatics - Modelling is expected.

Workload:

- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h

Literature

- W. van der Aalst, H. van Kees: Workflow Management: Models, Methods and Systems, Cambridge, The MIT Press, 2002.
- W. van der Aalst: Process Mining: Data Science in Action. Springer, 2016.
- J. Carmona, B. van Dongen, A. Solti, M. Weidlich: Conformance Checking: Relating Processes and Models. Springer, 2018.
- A. Drescher, A. Koschmider, A. Oberweis: Modellierung und Analyse von Geschäftsprozessen: Grundlagen und Übungsaufgaben mit Lösungen. De Gruyter Studium, 2017.
- A. Oberweis: Modellierung und Ausführung von Workflows mit Petri-Netzen. Teubner-Reihe Wirtschaftsinformatik, B.G. Teubner Verlag, 1996.
- R. Peters, M. Nauroth: Process-Mining: Geschäftsprozesse: smart, schnell und einfach, Springer, 2019.
- F. Schönthaler, G. Vossen, A. Oberweis, T. Karle: Business Processes for Business Communities: Modeling Languages, Methods, Tools. Springer, 2012.
- M. Weske: Business Process Management: Concepts, Languages, Architectures. Springer, 2012.

Weitere Literatur wird in der Vorlesung bekannt gegeben.

T**6.119 Module component: Production and Logistics [T-WIWI-111632]**

Coordinators: Prof. Dr. Wolf Fichtner
 Prof. Dr. Stefan Nickel
 Prof. Dr. Frank Schultmann

Organisation: KIT Department of Business and Economics

Part of: [M-WIWI-105267 - Business Administration](#)

Type	Credits	Grading	Term offered	Version
Written examination	3 CP	graded	Each winter term	1

Exams			
WT 25/26	7900231	Production and Logistics	Schultmann, Nickel, Fichtner
ST 2026	7900080	Production and Logistics	Schultmann, Nickel, Fichtner

Assessment

Written examination (60 min) on the course "Production and Logistics". The exam is offered at the beginning of each lecture-free period. Repeat examinations are possible at any regular examination date.

Prerequisites

None

T

6.120 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
Written examination

Credits
3,5 CP

Grading
graded

Term offered
Each winter term

Version
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

6.121 Module component: Programming [T-INFO-101531]

Coordinators: Prof. Dr.-Ing. Anne Kozirolek
Prof. Dr. Ralf Reussner

Organisation: KIT Department of Informatics

Part of: [M-INFO-101174 - Programming](#)
[M-WIWI-104843 - Orientation Exam](#)

Type
Examination of another type

Credits
5 CP

Grading
graded

Term offered
Each winter term

Version
1

Courses					
WT 25/26	2424004	Programming	4 SWS	Lecture / Practice	Kozirolek
ST 2026	2400083	Programming Exercise	0 SWS	Practice / 	Kozirolek
Exams					
WT 25/26	7500075	Programming			Kozirolek
ST 2026	7500195	Programming			Reussner, Kozirolek

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.122 Module component: Programming Paradigms [T-INFO-101530]

Coordinators: Prof. Dr. Sebastian Erdweg
Prof. Dr. Ralf Reussner

Organisation: KIT Department of Informatics

Part of: [M-INFO-101179 - Programming Paradigms](#)

Type
Written examination

Credits
6 CP

Grading
graded

Term offered
Each winter term

Version
2

Courses					
WT 25/26	2424030	Programming Paradigms	4 SWS	Lecture / Practice / 	Reussner, Platzer, König, Schaefer, Erdweg
Exams					
WT 25/26	7500173	Programming Paradigms			Reussner, Schaefer, Erdweg
ST 2026	7500061	Programming Paradigms			Reussner, Erdweg

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Below you will find excerpts from courses related to this module component:

V

Programming Paradigms

2424030, WS 25/26, 4 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)
On-Site

Literature

Wird in der Vorlesung bekannt gegeben.

T

6.123 Module component: Programming Pass [T-INFO-101967]

Coordinators: Prof. Dr.-Ing. Anne Koziolk
Prof. Dr. Ralf Reussner

Organisation: KIT Department of Informatics

Part of: [M-INFO-101174 - Programming](#)
[M-WIWI-104843 - Orientation Exam](#)

Type	Credits	Grading	Term offered	Version
Coursework	0 CP	pass/fail	Each term	1

Courses					
WT 25/26	2424004	Programming	4 SWS	Lecture / Practice	Koziolk
ST 2026	2400083	Programming Exercise	0 SWS	Practice / 	Koziolk
Exams					
WT 25/26	7500074	Programming Pass			Koziolk
ST 2026	7500022	Programming Pass			Koziolk, Reussner

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.124 Module component: Public Law I & II [T-INFO-110300]

Coordinators: TT-Prof. Dr. Frederike Zufall

Organisation: KIT Department of Informatics

Part of: [M-INFO-105247 - Constitutional and Administrative Law](#)
[M-INFO-107555 - German and European Public Law](#)

Type
Written examination

Credits
6 CP

Grading
graded

Term offered
Each summer term

Version
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

6.125 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
Written examination

Credits
4,5 CP

Grading
graded

Term offered
Each summer term

Version
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

6.126 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**6.127 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:

- Quaschnig, V. (2019), Regenerative Energiesysteme, Technologie - Berechnung – Klimaschutz, Carl Hanser Verlag München
- Quaschnig, 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**6.128 Module component: Research Practical Course: Explainable Artificial Intelligence [T-INFO-113114]****Coordinators:** TT-Prof. Dr. Rudolf Lioutikov**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-106495 - Research Practical Course: Explainable Artificial Intelligence](#)**Type**
Examination of another type**Credits**
6 CP**Grading**
graded**Term offered**
Each winter term**Version**
1

Courses					
WT 25/26	2400142	Forschungspraktikum: Explainable Artificial Intelligence	4 SWS	Practical course / 	Lioutikov, Li, Mattes
Exams					
WT 25/26	7500360	Research Practical Course: Explainable Artificial Intelligence			Lioutikov

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). The overall impression is evaluated. The following partial aspects are included in the grading: Term paper (approx. 10 pages), Presentation (duration approx. 20 min.), Practical training (protocols)

Presentation on the chosen topic at the end of the semester and written paper.

Prerequisites

None

Recommendations

We recommend taking this Praktikum after attending the “Explainable Artificial Intelligence” lecture in the summer semester.

We highly recommend to take this research project in combination with the “Explainable Artificial Intelligence” seminar.

- Experience in Machine Learning is recommended, e.g. through prior coursework.
- The Computer Science Department offers several great lectures e.g., “Maschinelles Lernen - Grundlagen und Algorithmen” and “Deep Learning”
- A good mathematical background will be beneficial
- Python experience is recommended
- We might use the PyTorch deep learning library In the exercises. Some prior knowledge in this is helpful but not necessary.

Additional Information

It is only possible to resign within two weeks after assignment of the topic.

T

6.129 Module component: Research Seminar in Selected Topics in Statistical Learning and Data Science [T-INFO-113674]**Coordinators:** Prof. Dr. Nadja Klein**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-106813 - Research Seminar in Selected Topics in Statistical Learning and Data Science](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Irregular	1

Courses					
ST 2026	24106813	Research Seminar in Selected Topics in Statistical Learning and Data Science	2 SWS	Seminar / 	Klein

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

Elaboration of the topic and presentation on the chosen topic at the end of the semester.

Prerequisites

Knowledge in Bayesian methods, uncertainty quantification and statistical learning or related methods for big data

Recommendations

Certified knowledge in Bayesian methods, uncertainty quantification and statistical learning or related methods for big data

Below you will find excerpts from courses related to this module component:

V

Research Seminar in Selected Topics in Statistical Learning and Data Science24106813, SS 2026, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)
Blended (On-Site/Online)****Content**

Welcome to the Research Seminar in Selected Topics in Statistical Learning and Data Science!

The seminar will focus on methods for Bayesian computation.

REGISTRATION: Please send an informal email asking for registration with your certificate of "Advanced Bayesian Data Analysis" or an equivalent course with a grade of 3.7 or better to: guillermo . briseno-sanchez at kit edu

You will receive a decision regarding your registration to the seminar shortly afterward.

Please keep in mind that **registration closes on March 14, 2025.**

T

6.130 Module component: Robotics I - Introduction to Robotics [T-INFO-114190]

Coordinators: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: [M-INFO-107162 - Robotics I - Introduction to Robotics](#)

Type	Credits	Grading	Term offered	Version
Written examination	6 CP	Graded	Each winter term	1

Courses					
WT 25/26	2424152	Robotics I - Introduction to Robotics	4 SWS	Lecture / 	Asfour, Mombaur
Exams					
WT 25/26	7500106	Robotics I - Introduction to Robotics			Asfour
ST 2026	7500218	Robotics I - Introduction to Robotics			Asfour

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is carried out as a written examination (§ 4 Abs. 2 No. 1 SPO) lasting 120 minutes.

Prerequisites

none.

Below you will find excerpts from courses related to this module component:

V

Robotics I - Introduction to Robotics

2424152, WS 25/26, 4 SWS, Language: English, [Open in study portal](#)

Lecture (V)
On-Site

Content

The lecture provides an overview of the fundamentals of robotics using the examples of industrial robots, service robots and autonomous humanoid robots. An insight into all relevant topics is given. This includes methods and algorithms for robot modeling, control and motion planning, image processing and robot programming. First, mathematical basics and methods for kinematic and dynamic robot modeling, trajectory planning and control as well as algorithms for collision-free motion planning and grasp planning are covered. Subsequently, basics of image processing, intuitive robot programming especially by human demonstration and symbolic planning are presented.

In the exercise, the theoretical contents of the lecture are further illustrated with examples. Students deepen their knowledge of the methods and algorithms by independently working on problems and discussing them in the exercise. In particular, students can gain practical programming experience with tools and software libraries commonly used in robotics.

Workload:

Lecture with 3 SWS + 1 SWS Tutorial, 6 LP

6 LP corresponds to 180 hours, including

15 * 3 = 45 hours attendance time (lecture)

15 * 1 = 15 hours attendance time (tutorial)

15 * 6 = 90 hours self-study and exercise sheets

30 hours preparation for the exam

Competency Goals:

The students are able to apply the presented concepts to simple and realistic tasks from robotics. This includes mastering and deriving the mathematical concepts relevant for robot modeling. Furthermore, the students master the kinematic and dynamic modeling of robot systems, as well as the modeling and design of simple controllers. The students know the algorithmic basics of motion and grasp planning and can apply these algorithms to problems in robotics. They know algorithms from the field of image processing and are able to apply them to problems in robotics. They are able to model and solve tasks as a symbolic planning problem. The students have knowledge about intuitive programming procedures for robots and know procedures for programming and learning by demonstration.

Organizational issues

The assessment is carried out as a written examination (§ 4 Abs. 2 No. 1 SPO) usually lasting 120 minutes.

Module for the bachelor and master courses in Informatics, Mechanical Engineering, Mechatronics and Information Technology, Electrical Engineering and Information Technology

Literature**Additional literature:**

Fu, Gonzalez, Lee: Robotics - Control, Sensing, Vision, and Intelligence

Russel, Norvig: Artificial Intelligence - A Modern Approach, 2nd. Ed.

T

6.131 Module component: Semantic Web Technologies [T-WIWI-110848]**Coordinators:** Dr.-Ing. Tobias Käfer**Organisation:** KIT Department of Business and Economics**Part of:** [M-WIWI-101438 - Semantic Knowledge Management](#)**Type**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each summer term**Version**
1

Courses					
ST 2026	2511310	Semantic Web Technologies	2 SWS	Lecture / 	Käfer, Braun, Kubelka
ST 2026	2511311	Exercises to Semantic Web Technologies	1 SWS	Practice / 	Käfer, Braun, Kubelka
Exams					
WT 25/26	79AIFB_SWebT_A2	Semantic Web Technologies (Registration extended until 16.02.2026)			Käfer
ST 2026	791-AIFB-SWebT-HK	Semantic Web Technologies (Registration until 20.07.2026)			Käfer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation or of an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.

The exam takes place every semester and can be repeated at every regular examination date.

Prerequisites

None

Recommendations

It is recommended that students have previously attended computer-science lectures from the Bachelor programmes Information Systems or Industrial Engineering and Management in semesters 1 – 4, or have taken equivalent courses.

Below you will find excerpts from courses related to this module component:

V

Semantic Web Technologies

2511310, SS 2026, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)
On-Site

Content

The aim of the Semantic Web is to make the meaning (semantics) of data on the web usable in intelligent systems, e.g. in e-commerce and internet portals

Central concepts are the representation of knowledge in form of RDF and ontologies, the access via Linked Data, as well as querying the data by using SPARQL. This lecture provides the foundations of knowledge representation and processing for the corresponding technologies and presents example applications.

The following topics are covered:

- Resource Description Framework (RDF) and RDF Schema (RDFS)
- Web Architecture and Linked Data
- Web Ontology Language (OWL)
- Query language SPARQL
- Rule languages
- Applications

Learning objectives:

The student

- understands the motivation and foundational ideas behind Semantic Web and Linked Data technologies, and is able to analyse and realise systems
- demonstrates basic competency in the areas of data and system integration on the web
- masters advanced knowledge representation scenarios involving ontologies

Recommendations:

Lectures on Informatics of the Bachelor on Information Systems (Semester 1-4) or equivalent are required. Knowledge of modeling with UML is required.

Workload:

- The total workload for this course is approximately 135 hours
- Time of presentness: 45 hours
- Time of preparation and postprocessing: 60 hours
- Exam and exam preparation: 30 hours

Literature

- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, York Sure: Semantic Web – Grundlagen. Springer, 2008.
- John Domingue, Dieter Fensel, James A. Hendler (Editors). Handbook of Semantic Web Technologies. Springer, 2011.

Weitere Literatur

- S. Staab, R. Studer (Editors). Handbook on Ontologies. International Handbooks in Information Systems. Springer, 2003.
- Tim Berners-Lee. Weaving the Web. Harper, 1999 geb. 2000 Taschenbuch.
- Ian Jacobs, Norman Walsh. Architecture of the World Wide Web, Volume One. W3C Recommendation 15 December 2004. <http://www.w3.org/TR/webarch/>
- Dean Allemang. Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL. Morgan Kaufmann, 2008.
- Tom Heath and Chris Bizer. Linked Data: Evolving the Web into a Global Data Space. Synthesis Lectures on the Semantic Web: Theory and Technology, 2011.

**Exercises to Semantic Web Technologies**

2511311, SS 2026, 1 SWS, Language: English, [Open in study portal](#)

**Practice (Ü)
On-Site**

Content

The exercises are related to the lecture Semantic Web Technologies.

Multiple exercises are held that capture the topics, held in the lecture Semantic Web Technologies, 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:

- Resource Description Framework (RDF) and RDF Schema (RDFS)
- Web Architecture and Linked Data
- Web Ontology Language (OWL)
- Query language SPARQL
- Rule languages
- Applications

Learning objectives:

The student

- understands the motivation and foundational ideas behind Semantic Web and Linked Data technologies, and is able to analyse and realise systems
- demonstrates basic competency in the areas of data and system integration on the web
- masters advanced knowledge representation scenarios involving ontologies

Recommendations:

Lectures on Informatics of the Bachelor on Information Systems (Semester 1-4) or equivalent are required. Knowledge of modeling with UML is required.

Literature

- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, York Sure: Semantic Web – Grundlagen. Springer, 2008.
- John Domingue, Dieter Fensel, James A. Hendler (Editors). Handbook of Semantic Web Technologies. Springer, 2011.

Weitere Literatur

- S. Staab, R. Studer (Editors). Handbook on Ontologies. International Handbooks in Information Systems. Springer, 2003.
- Tim Berners-Lee. Weaving the Web. Harper, 1999 geb. 2000 Taschenbuch.
- Ian Jacobs, Norman Walsh. Architecture of the World Wide Web, Volume One. W3C Recommendation 15 December 2004. <http://www.w3.org/TR/webarch/>
- Dean Allemang. Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL. Morgan Kaufmann, 2008.
- Tom Heath and Chris Bizer. Linked Data: Evolving the Web into a Global Data Space. Synthesis Lectures on the Semantic Web: Theory and Technology, 2011.

T**6.132 Module component: Seminar Decentralized Systems and Network Services [T-INFO-106064]****Coordinators:** Prof. Dr. Hannes Hartenstein**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-103048 - Seminar Decentralized Systems and Network Services](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Irregular	1

T

6.133 Module component: Seminar Dependable Computing [T-INFO-105577]

Coordinators: Prof. Dr. Mehdi Baradaran Tahoori
Organisation: KIT Department of Informatics
Part of: [M-INFO-102662 - Seminar Dependable Computing](#)

Type
Examination of another type

Credits
3 CP

Grading
graded

Term offered
Each term

Version
1

Courses					
WT 25/26	2400030	Dependable Computing	2 SWS	Seminar /	Tahoori
ST 2026	2400030	Dependable Computing	2 SWS	Seminar /	Tahoori
Exams					
WT 25/26	7500152	Seminar Dependable Computing			Tahoori
ST 2026	7500118	Seminar Dependable Computing			Tahoori

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A written paper must be prepared and a presentation given. Withdrawal is possible within two weeks of the topic being assigned. The module grade is made up of 50% of the presentation and 50% of the written paper.

Prerequisites

None.

Recommendations

Knowledge of "Dependable Computing" and "Fault Tolerant Computing" and computer architecture is helpful.

Below you will find excerpts from courses related to this module component:

V

Dependable Computing

2400030, WS 25/26, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
On-Site

Content

Reliability and Security play a major role in design of contemporary and next generation electronics and memories. In many safety-critical application domains, reliability is considered as the main design criteria. With nanoscale technologies, the reliability of individual devices is decreasing, therefore reliable computing must be considered in the design flow in order to ensure correctness of computing.

The objective of this seminar is to become familiar with general and state of the art techniques used in design and analysis of fault-tolerant and security-driven digital systems. This seminar overviews reliable (fault-tolerant) computing, hardware security designs and emerging memory devices.

Various topics can be envisioned in the scope of this seminar and the prospective students can choose specific topic from a wide range of areas based on their interests and background.

Organizational issues

Bitte im Campussystem und per email unter cdnc@itec.kit.edu anmelden.

Beinhaltet ebenfalls die Seminare *Non-volatile Memory Technologies* und *Hardware Security*.

Auftaktveranstaltung "wird noch bekannt gegeben"

Building 07.21 -Technologiefabrik

V

Dependable Computing

2400030, SS 2026, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
Blended (On-Site/Online)

Content

Reliability and Security play a major role in design of contemporary and next generation electronics and memories. In many safety-critical application domains, reliability is considered as the main design criteria. With nanoscale technologies, the reliability of individual devices is decreasing, therefore reliable computing must be considered in the design flow in order to ensure correctness of computing.

The objective of this seminar is to become familiar with general and state of the art techniques used in design and analysis of fault-tolerant and security-driven digital systems. This seminar overviews reliable (fault-tolerant) computing, hardware security designs and emerging memory devices.

Various topics can be envisioned in the scope of this seminar and the prospective students can choose specific topic from a wide range of areas based on their interests and background.

Organizational issues

Bitte im Campussystem und per email unter cdnc@itec.kit.edu anmelden.

Beinhaltet ebenfalls die Seminare *Non-volatile Memory Technologies* und *Hardware Security*.

T**6.134 Module component: Seminar Image Analysis and Fusion [T-INFO-104743]**

Coordinators: Prof. Dr.-Ing. Jürgen Beyerer
Organisation: KIT Department of Informatics
Part of: [M-INFO-102375 - Seminar Image Analysis and Fusion](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	Graded	Each summer term	1

Courses					
ST 2026	2400035	Seminar Image Analysis and Fusion	2 SWS	Seminar / 	Beyerer
Exams					
ST 2026	7500033	Seminar Image Analysis and Fusion			Beyerer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Below you will find excerpts from courses related to this module component:

V**Seminar Image Analysis and Fusion**

2400035, SS 2026, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)
On-Site

Organizational issues

Termin und Ort der Einführungsveranstaltung werden vor Semesterbeginn auf der Webseite bekannt gegeben.

Findet - sofern Präsenz-Veranstaltung erlaubt - im Fraunhofer IOSB statt.

T

6.135 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-101826 - Seminar Module Economic Sciences

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	2500038	AI in Human Domains: Decision-Making, Oversight, and Accountability	2 SWS	Seminar / 	Pfeiffer, Hüholt, Bennardo
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	7900256	Seminar Positive Information Systems	Weinhardt
ST 2026	7900261	Human-Centered Systems Seminar: Research	Mädche
ST 2026	7900265	Biosignal-Adaptive Systems Seminar	Mädche
ST 2026	7900312	Seminar Sustainable Information Systems and Digital Energy Markets	Staudt
ST 2026	7900314	Seminar Financial Economics "Momentum Strategies Replication" (Bachelor)	Thimme
ST 2026	7900318	Seminar Covert Influences on the Social Media Discourse	Staudt
ST 2026	7900326	Seminar Energy Economics VI	Fichtner
ST 2026	7900327	Special Topics in Transportation Strategy	Lindstädt
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 / AI in Human Domains	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:

**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 phase.

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



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



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](#)).

**Business Data Analytics**2540473, WS 25/26, 2 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)**
On-Site**Content**

wird auf deutsch und englisch gehalten

Organizational issues

Blockveranstaltung, siehe WWW

**Bachelor Seminar in Data Science and Machine Learning**2540524, WS 25/26, 2 SWS, Language: German, [Open in study portal](#)**Seminar (S)****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

**Seminar: Human Resources and Organizations (Bachelor)**2573010, WS 25/26, 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

Blockveranstaltung siehe Homepage

**Seminar: Human Resource Management (Bachelor)**2573011, WS 25/26, 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

Blockveranstaltung siehe Homepage

**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.



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 is 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. **Cyclicity:** Why is there such a high cyclicity 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. **Profitability (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.



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.

**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.

**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

**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

**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

6.136 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-101826 - Seminar Module Economic Sciences**Type**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Each term**Version**
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	Schienze, 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	Schienze, Allen, Zhang
ST 2026	2500035	Efficiency analyses in network sectors	2 SWS	Seminar / 🎤	Mitusch, Latsch
ST 2026	2500036	Topics in Econometrics	2 SWS	Seminar	Schienze, Krüger, Rüter
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			Schienze, 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	00019	Seminar: How Wise is the Crowd? Group Decisions in Theory and Practice (Bachelor)	Puppe
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
ST 2026	7900356	Seminar in Economics (Bachelor)	Brumm

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:

Economics of Crime
2500063, WS 25/26, 2 SWS, [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.

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

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

Seminar in Digital Economics (Bachelor)
2560140, WS 25/26, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)
On-Site

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.

**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)

**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

**Topics in Econometrics**

2500036, SS 2026, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

Organizational issues

Blockveranstaltung, Termine werden auf Homepage und über Ilias bekannt gegeben

**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.

**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

6.137 Module component: Seminar in Informatics (Bachelor) [T-WIWI-112836]

Coordinators: Professorenschaft des Instituts AIFB
Organisation: KIT Department of Business and Economics
Part of: [M-INFO-106327 - Informatics Seminar](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Each term	1

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

T

6.138 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-107691 - Seminar Module Applied Informatics](#)**Type**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Each term**Version**
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.

RecommendationsSee 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:

**Seminar Linked Data and the Semantic Web (Bachelor)**

2513312, WS 25/26, 3 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
On-Site

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.

**Seminar Real-World Challenges in Data Science and Analytics (Bachelor)**

2513314, WS 25/26, 3 SWS, Language: German/English, [Open in study portal](#)

On-Site

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.

**Seminar Real-World Challenges in Data Science and Analytics (Master)**

2513315, WS 25/26, 3 SWS, Language: German/English, [Open in study portal](#)

On-Site

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.

**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 jeweiligen Themen 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.

**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/>.

T

6.139 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-101826 - Seminar Module Economic Sciences](#)

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 / 	Nickel, Mitarbeiter, Pomes, Hoffmann
WT 25/26	2550131	Seminar on Methodical Foundations of Operations Research (B)	2 SWS	Seminar / 	Stein, Beck, Schwarze, Neussel
WT 25/26	2550461	Seminar on Trending Topics in Optimization and Machine Learning (Bachelor)	2 SWS	Seminar / 	Rebennack, Kandora
WT 25/26	2550472	Seminar on Energy and Power Systems Optimization (Bachelor)	2 SWS	Seminar / 	Rebennack, Kandora
ST 2026	2500028	Seminar: Modern OR and Innovative Logistics	2 SWS	Seminar / 	Nickel, Mitarbeiter, Pomes
ST 2026	2550131	Seminar on Methodical Foundations of Operations Research (BA)	2 SWS	Seminar / 	Stein, Schwarze, Neussel, Huber
ST 2026	2550132	Seminar on Mathematical Optimization (MA)	2 SWS	Seminar / 	Stein, Schwarze, Neussel, Huber
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	7900026	Seminar Modern OR and Innovative Logistics			Nickel
ST 2026	7900200_SS2025	Seminar in Operations Research A (Master)			Stein
ST 2026	7900201_SS2025	Seminar in Operations Research (Bachelor)			Stein
ST 2026	7900307	Digitalization in the Steel Industry			Nickel

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:

**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.

**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 students 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 scientific 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 Literatur 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 preparatory meeting.

**Seminar: Modern OR and Innovative Logistics**

2500028, SS 2026, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)
Blended (On-Site/Online)

Content

The seminar aims at the presentation, critical evaluation and exemplary discussion of recent questions in discrete optimization. The focus lies on optimization models and algorithms, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management). The students get in touch with scientific working: The in-depth work with a special scientific topic makes the students familiar with scientific literature research and argumentation methods. As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic. Regarding the seminar presentations, the students will be familiarized with basic presentational and rhetoric skills.

Organizational issues

Anmeldung erfolgt über das Wiwi-Portal. Nähere Informationen hierzu finden Sie hier zu einem späteren Zeitpunkt.

Literature

Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.

**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 student 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 scientific 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 Literatur 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 preparatory meeting.

T

6.140 Module component: Seminar in Privacy [T-INFO-114268]

Coordinators: Prof. Dr. Thorsten Strufe
Organisation: KIT Department of Informatics
Part of: [M-INFO-107242 - Seminar in Privacy](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	4 CP	graded	Each summer term	1

Courses					
ST 2026	2400087	Seminar in Privacy	2 SWS	Seminar / 	Strufe, Guerra Balboa

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A written paper must be prepared and a presentation given; in addition, preliminary papers must be submitted and commented on in a peer review between fellow students. Withdrawal is possible within two weeks of the topic being assigned.

Prerequisites

None.

Recommendations

Fundamentals of IT security, computer networks and distributed systems are required

Below you will find excerpts from courses related to this module component:

V

Seminar in Privacy

2400087, SS 2026, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
On-Site

Content

This Seminar discusses current topics of the research field technical data security.

This involves, for example:

- anonymous communication
- network security
- anonymous online- services
- anonymous digital payment services
- rating of the anonymity of online services
- anonymous publications of data (differential privacy, k- anonymity)
- transparency-/awareness-improvement systems
- support for media understanding.

T

6.141 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-101826 - Seminar Module Economic Sciences](#)

Type
Examination of another type

Credits
3 CP

Grading
graded

Term offered
Each term

Version
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	2500036	Topics in Econometrics	2 SWS	Seminar	Schienle, Krüger, Rüter
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:



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.



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



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

**Topics in Econometrics**2500036, SS 2026, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

Organizational issues

Blockveranstaltung, Termine werden auf Homepage und über Ilias bekannt gegeben

**Advanced Topics in Econometrics**2521310, SS 2026, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

Organizational issues

wöchentlich, Donnerstags 13:00-14:30, B17, R320

T

6.142 Module component: Seminar Informatics [T-INFO-112835]

Coordinators: Prof. Dr. Sebastian Abeck
Organisation: KIT Department of Informatics
Part of: M-INFO-106327 - Informatics Seminar

Type
Examination of another type

Credits
3 CP

Grading
graded

Version
1

Courses					
WT 25/26	2400006	Seminar Fortgeschrittene Algorithmen in der Computergrafik	2 SWS	Seminar /	Schudeiske, Dachsbacher
WT 25/26	2400013	Seminar: Energy Informatics	2 SWS	Seminar /	Hagenmeyer, Schmurr, Langner, Rapp
WT 25/26	2400048	Humanoid Robots - Seminar	2 SWS	Seminar /	Asfour
WT 25/26	2400060	Data in Software-Intensive Technical Systems – Modeling – Analysis – Protection	2 SWS	Seminar /	Reussner, Raabe, Werner, Müller-Quade
WT 25/26	2400072	Seminar: Service-oriented Architectures	2 SWS	Seminar /	Abeck, Schneider
WT 25/26	2400074	Advanced Topics in Natural Language Processing	2 SWS	Seminar	Niehues, Li
WT 25/26	2400078	Seminar: Neuronale Netze und künstliche Intelligenz	2 SWS	Seminar	Waibel, Retkowski
WT 25/26	2400099	Deep Learning for Robotics	2 SWS	Seminar /	Neumann
WT 25/26	2400118	Seminar Privacy and Security	2 SWS	Seminar	Strufe, Guerra Balboa
WT 25/26	2400142	Forschungspraktikum: Explainable Artificial Intelligence	4 SWS	Practical course /	Lioutikov, Li, Mattes
WT 25/26	2400143	Seminar: Explainable Artificial Intelligence	2 SWS	Seminar /	Lioutikov, Mattes, Li
WT 25/26	2400187	Seminar: Exoskeletons & Motion Capture	2 SWS	Seminar /	Mombaur, Lau
WT 25/26	2400194	Failing Forward: Robotics, Critical Reading and the Making of Good Research - Seminar	2 SWS	Seminar /	Bruno, Maure, Neef
WT 25/26	2400196	Seminar: Applications and Extensions of Timed Systems	2 SWS	Seminar /	Schwammberger
WT 25/26	2400202	Advances in Data Science		Seminar /	Böhm, Matteucci
WT 25/26	2400245	Do LLMs understand cause and effect?	2 SWS	Seminar /	Janzing
WT 25/26	24004	Seminar: Hot Topics in Security of Machine Learning	2 SWS	Seminar /	Wressnegger, Zhao
WT 25/26	24005	Seminar: Hot Topics in Cyber-Physical Systems Security	2 SWS	Seminar /	Wressnegger
WT 25/26	2424344	Advanced Methods of Information Fusion	2 SWS	Seminar /	Hanebeck
ST 2026	2400032	Seminar Speech-to-Speech Translation	2 SWS	Seminar /	Niehues
ST 2026	2400035	Seminar Image Analysis and Fusion	2 SWS	Seminar /	Beyerer
ST 2026	2400063	Motion in Human and Machine	3 SWS	Seminar /	Asfour
ST 2026	2400080	Research Trends in Human-Computer Interaction (Seminar)	2 SWS	Seminar /	Gerling
ST 2026	2400084	Seminar: Robot Reinforcement Learning	2 SWS	Seminar /	Neumann

ST 2026	2400130	Neural Networks and Artificial Intelligence	2 SWS	Seminar	Waibel, Retkowski
ST 2026	2400131	Advances in Data Science	2 SWS	Seminar / 	Böhm, Matteucci, Friederich
ST 2026	2400137	Embedded Machine Learning		Seminar / 	Henkel, Sikal, Khdr, Ahmed, Demirdag, Mentzos
ST 2026	2400145	Do LLMs understand cause and effect?	2 SWS	Seminar / 	Janzing
ST 2026	2400148	Embedded Security and Architectures		Seminar / 	Henkel, Nassar, Khdr, Sikal, Tobar, Alsharkawy, Dietrich
ST 2026	2400181	Interpretability and Causality in Machine Learning	2 SWS	Seminar / 	Stühmer
ST 2026	2400196	Practical Graph Algorithms	2 SWS	Seminar	Meyerhenke
ST 2026	2400217	Advanced Topics in Natural Language Processing	2 SWS	Seminar	Niehues
ST 2026	24005	Seminar: Hot Topics in Explainable Artificial Intelligence (XAI)	2 SWS	Seminar / 	Wressnegger, Noppel
ST 2026	2424816	Seminar Fortgeschrittene Algorithmen in der Computergrafik	2 SWS	Seminar / 	Alber, Dachsbacher
ST 2026	24344	Advanced Methods of Information Fusion	2 SWS	Seminar / 	Hanebeck
ST 2026	24844	Seminar: Ubiquitous Systems	2 SWS	Seminar / 	Beigl
ST 2026	2500125	Human-Centered Systems Seminar: Engineering	3 SWS	Seminar / 	Mädche
ST 2026	2540553	Biosignal-Adaptive Systems Seminar	2 SWS	Seminar / 	Mädche, Beigl
ST 2026	2540557	Human-Centered Systems Seminar: Research	3 SWS	Seminar / 	Mädche
Exams					
WT 25/26	7500224	Seminar: Neural Networks and Artificial Intelligence			Niehues
WT 25/26	7500232	Seminar Data in Software-Intensive Technical Systems – Modeling – Analysis – Protection			Reussner
WT 25/26	7500360	Research Practical Course: Explainable Artificial Intelligence			Lioutikov
WT 25/26	7500384	Seminar: Explainable Artificial Intelligence			Lioutikov
WT 25/26	7500389	Seminar: Failing Forward: Robotics, Critical Reading and the Making of Good Research			Bruno
ST 2026	00017	Seminar Neural Networks and Artificial Intelligence			Niehues
ST 2026	7500014	Seminar: Hot Topics in Bioinformatics			Stamatakis
ST 2026	7500100	Seminar Information Systems			Böhm
ST 2026	7500289	Motion in Man and Machine - Seminar			Asfour
ST 2026	7500319	Seminar: Interpretability and Causality in Machine Learning			Stühmer
ST 2026	75104740	Seminar: Service-Oriented Architectures			Abeck
ST 2026	7900190	Human-Centered Systems Seminar: Engineering			Mädche
ST 2026	7900261	Human-Centered Systems Seminar: Research			Mädche
ST 2026	7900265	Biosignal-Adaptive Systems Seminar			Mädche

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Below you will find excerpts from courses related to this module component:

	Seminar: Energy Informatics	Seminar (S)
	2400013, WS 25/26, 2 SWS, Language: German/English, Open in study portal	On-Site

Content

Energy informatics is a young field of research at the interface of electrical engineering, computer science, economics and law, in which questions about energy systems are dealt with. Issues arising from climate change and the increasing use of renewable energy sources are of particular interest.

In the "Energy Informatics" seminar, we look at selected issues arising from current research. These questions consider, for example, modeling, algorithms or simulations in the context of energy systems.

This seminar is aimed at Master's students in subjects that overlap with energy informatics, for example computer science, mechanical engineering, information systems, econometrics, business engineering or economics engineering. If you have any questions regarding credit transfer, please contact your study program service.

Ideally, students should have an in-depth insight into the subject areas of energy informatics and have basic knowledge of modeling, simulation and algorithms.

Other participants: Prof. Dr. Veit Hagenmeyer, T.T.-Prof. Dr. Thomas Bläsius

Workload: 4 CP corresponds to approx. 120 hours, approx. 21 hours attending the seminar, approx. 45 hours analyzing and working on the topic, approx. 27 hours preparing and creating the presentation and approx. 27 hours writing the paper.

Learning objectives: Based on a given topic, participants identify, collect and evaluate relevant literature. They classify the topic within the subject area of "energy informatics".

Participants prepare a seminar paper and take format specifications into account. Students critically examine other seminar papers and write reviews of the seminar papers of others.

In presentations, the participants present the most important content of their seminar paper in an auditorium-friendly manner and discuss it with the audience.

**Humanoid Robots - Seminar**

2400048, WS 25/26, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)
On-Site

Content

The students choose a topic from the field of humanoid robotics, e.g. robot design, motion, perception, learning and conduct a mostly independent literature research on that topic with the support of an experienced supervisor. At the end of the semester they present their results and write a paper in English in the style of a scientific publication.

Learning Objectives:

The students have gained experience in doing independent literature research on a topic of ongoing research. They have studied, understood and compared different approaches tackling the selected scientific problem. The students are able to write a survey of the different approaches in English and in the style of a scientific publication, and to give a talk on the chosen topic.

Examination: Oral presentation at the end of the semester, and a written paper.

Registration ILIAS

Contact: humanoid-robotics-seminar@lists.kit.edu

Distribution of topics at the beginning of the lecture time

Organizational issues**Zugehörige Veranstaltungen:**

Empfehlungen:

- Vorlesung Anthropomatik: Humanoide Roboter
- Praktikum Humanoide Roboter
- Robotik 1, Robotik 2, Robotik 3
- Maschinelles Lernen
- Visuelle Perzeption für Mensch-Maschine-Schnittstellen

Arbeitsaufwand: 90 h

**Advanced Topics in Natural Language Processing**

2400074, WS 25/26, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

Content

Seminar: Advanced Topics in Machine Translation

Machine translation has now made it possible to automatically translate both written text and spoken language into another language. In neural machine translation, methods from machine learning are primarily used to model the translation process.

In the seminar, current research results on various aspects of the systems will be discussed. For this purpose, publications from the areas selected by the participants will be presented. Possible topics include use of Transformer-trained models and large language models (LLMs), multilingualism, new methods of deep learning for translation, quality estimation and integration of additional context.

Requirements:

Prior knowledge from the "Machine Translation" lecture is an advantage.

Lecture language is English.

Organizational issues

Raum 223, Geb. 50.20

**Seminar: Neuronale Netze und künstliche Intelligenz**

2400078, WS 25/26, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

Content

In many tasks that appear natural to us, the fastest computers are unable to match the performance of the human brain. Neural networks attempt to simulate the parallel and distributed architecture of the brain in order to master these skills with learning algorithms. In this context, focus is being put on neural network approaches to computer vision and speech recognition, robotics and other areas.

In this seminar students will acquaint themselves with literature from provided topics and will present their results as a talk supported by slides to the other participants of the seminar.

Recommendations:

- Finishing the module "Kognitive Systeme" prior to the seminar is recommended.
- Attending the lecture "Deep Learning und Neuronale Netze" prior to the seminar is of advantage

**Deep Learning for Robotics**

2400099, WS 25/26, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)
On-Site

Content

Each student has to choose one of the offered topics from the area of deep learning / robot learning / deep reinforcement learning / deep imitation learning.

Each topic consists of several research papers for which the students have to prepare a presentation as well as a report in form of a scientific research paper.

It is recommended to take the seminar together with the "Research Project Deep Learning for Robotics", where the presented algorithms will be implemented and evaluated.

Students will work in teams of 2.

Students are able to independently understand a complex research topic, present the content in a concise and understandable way and prepare a scientific report summarizing the topic.

Students are able to independently understand a complex research topic, present the content in a concise and understandable way and prepare a scientific report summarizing the topic. Students get a deeper understanding of state-of-the-art learning algorithms and get to know current research challenges.

Vortrag zum gewählten Thema am Ende des Semesters und schriftliche Ausarbeitung.

Der Besuch der Vorlesung „Maschinelles Lernen - Grundlagen und Algorithmen“ ist empfehlenswert.

Organizational issues

Mehr Informationen in ILIAS

**Seminar Privacy and Security**

2400118, WS 25/26, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

Content

This Seminar discusses current topics of the research field technical data security.

This involves, for example:

- anonymous communication
- network security
- anonymous online- services
- anonymous digital payment services
- rating of the anonymity of online services
- anonymous publications of data (differential privacy, k- anonymity)
- transparency-/awareness-improvement systems
- support for media understanding.

Organizational issues

Die Anmeldung geschieht über ILIAS. Die genauen Termine finden Sie im ILIAS-Kurs und auf der Webseite des Lehrstuhls.

**Seminar: Exoskeletons & Motion Capture**

2400187, WS 25/26, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
On-Site

Content

This seminar provides insight into the current state of research and practical application of exoskeletons in medicine and their potential to improve the quality of life for people with and without physical impairments. On the other hand, there is an overview of various motion capture technologies, such as devices and methods for recording human movement, which play an important role in exoskeletons but have many other applications. Exoskeletons—also known as wearable robots—are used to improve mobility and are worn directly on the body to support or completely replace muscle strength. One type of exoskeleton assists people with limited mobility in walking, standing, and other physical activities, enabling them to regain their independence and participate in everyday activities. Other types of exoskeletons are used by healthy people to prevent injuries in difficult working conditions. Motion capture applications span many disciplines in which human behavior and movement are of interest, such as sports science, biomechanics, medicine, psychology, etc., but they also play an important role in the creation of animated films and computer games. In robotics, and especially in the development of exoskeletons, they are important for analyzing human-robot interaction and improving robot design and control. Various motion capture technologies exist for recording movement kinematics, ground reaction forces, and muscle activity. The seminar topics cover the spectrum of different exoskeleton types and motion capture technologies. Procedure: In a session during the first week of the semester, the seminar topic and the individual presentation topics will be presented in detail and assigned to students according to their preferences. Over the course of the semester, students will conduct literature research under supervision and prepare a presentation and a corresponding paper. Since most of the academic literature is in English, the paper should also be written in English. Presentations can be given in either English or German and will take place in one or more block sessions in the last third of the semester. There are still a few places available in the seminar for master's students. If you are interested, please contact jan.lau@kit.edu. The topic presentation will take place this semester on November 5 at 2:00 p.m. in Seminar Room 2, InformatiKOM 1.

Organizational issues

Vorbesprechung am Mittwoch, den 23.10.24 um 14:00 im Seminarraum 2

**Failing Forward: Robotics, Critical Reading and the Making of Good Research - Seminar**

2400194, WS 25/26, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)
On-Site

Content

The students choose a topic from the field of human-robot interaction, e.g. attention modelling, socially-aware navigation, social gestures generation or metrics for HRI experiments. They conduct a literature research on this topic under the guidance of a scientific supervisor. At the end of the semester, they present the results and write an elaboration in English in the form of a scientific publication.

Competency Goals:

The students gain experience with literature research on a current research topic. They explore, understand and compare different approaches to a selected scientific problem. The students are able to write a summary of their literature research in the form of a scientific publication in English and give a scientific talk on it.

Organizational issues**Workload:**

Seminar with 2 SWS, 3 LP.

3 LP corresponds to approx. 90 hours, of which

approx. 45 hours of literature research

approx. 25 hrs. elaboration

approx. 10 hrs. preparation of presentation

approx. 10 hrs. compulsory attendance

Competency certificate:

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). The overall impression is evaluated. The following partial aspects are included in the grading: Term paper (approx. 6 pages in double-column format), Presentation (duration approx. 10+10 min.).

**Seminar: Hot Topics in Security of Machine Learning**

24004, WS 25/26, 2 SWS, Language: German/English, [Open in study portal](#)

**Seminar (S)
On-Site**

Content

This seminar is concerned with the combination of artificial intelligence, machine learning and computer security in practice. Many tasks in the security landscape are based on manual labor, such as searching for vulnerabilities or analyzing malware. Here, machine learning can be used to establish a higher degree of automation, providing more "intelligent" security solutions (AI for Security). However, also these learning-based systems can be attacked and need to be secured (Security of AI).

This module is part of a seminar series to intensify the contents of the AISEC lecture. It can be attended individually and in no particular order. The module puts focus on timely topics from recent research and teaches students to work up results from state-of-the-art research. To this end, they will read up on a sub-field, prepare a seminar report, and present their work at the end of the term to their colleagues.

Organizational issues

English Course

**Advanced Methods of Information Fusion**

2424344, WS 25/26, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)
On-Site**

Content

The growing spread and performance of modern information and communication technologies produces an ever-increasing amount of data. It is one of the central challenges of our time to extract meaningful information from these data sets. The approach to address these issues, often called data science, combines strategies and methods from the fields of machine learning, mathematics, state estimation, visualization and pattern recognition. During this seminar, the students will familiarize themselves with concepts and methods particularly focusing on estimation theory and its application.

The seminar targets master students in computer science and bachelor students in Information engineering and management.

Organizational issues

Gemeinsame Einführungsveranstaltung von Proseminar 2424060 & Seminar 2424344 am 27.10.2025 in Raum 148, Gebäude 50.20.

**Seminar Speech-to-Speech Translation**

2400032, SS 2026, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)
On-Site**

Content

In a globalized world, language barriers are a major obstacle for communication. Speech-to-Speech translation (S2ST) technology is a promising solution to overcome this barrier. S2ST models convert source speech into speech in another language. Within S2ST, knowledge from automatic speech recognition and machine translation models are combined. Starting from solutions that simply combine individual systems, recently many interesting research directions have been explored (e.g., end-to-end models, simultaneous speech translation, speech synthesis, etc.).

In this seminar, students will delve into a chosen topic from the area of S2ST, based on the provided initial literature. At the end of the semester, the students will present their findings in oral presentations and written reports. The topics and the corresponding supervisors will be presented during the kickoff meeting.

Only the kickoff meeting and final presentations are attended by all participants together. During the semester, the communication will be with the topic supervisors individually.

Please do not join this seminar and our other seminar "Advanced Topics in Natural Language Processing" in parallel.

**Seminar Image Analysis and Fusion**2400035, SS 2026, 2 SWS, Language: German, [Open in study portal](#)**Seminar (S)**
On-Site**Organizational issues**

Termin und Ort der Einführungsveranstaltung werden vor Semesterbeginn auf der Webseite bekannt gegeben.

Findet - sofern Präsenz-Veranstaltung erlaubt - im Fraunhofer IOSB statt.

**Motion in Human and Machine**2400063, SS 2026, 3 SWS, Language: English, [Open in study portal](#)**Seminar (S)**
On-Site**Content**

This interdisciplinary block seminar addresses methods for modeling, generating, and controlling movements in human and robot systems. Students gain insight into this interdisciplinary field, learning fundamentals of capturing biological motion, biomechanical simulation, robotics, and machine learning.

The seminar begins with the generation of human movement as an effect of muscle contraction. It covers how observed movement patterns can be identified and categorized. Methods for learning movement primitives from human demonstrations are presented, including approaches for reproducing these patterns on humanoid robots. The seminar addresses the challenge of mapping human motion to robots with different kinematics and dynamics. Students learn how motion primitives enable transfer of human movements to robotic systems and their application to motion generation in humanoid robots.

Students work in small groups on collaborative projects that apply the learned methods. These projects allow students to deepen their understanding through practical application of the methods.

Competency Goals:

Students understand methods for modeling, processing, and analyzing human motions. They can explain approaches for capturing biological motion and biomechanical simulation.

Students can describe methods for learning motion primitives from human demonstrations and understand how human motion is mapped to robots with different kinematics and dynamics. They can apply these methods in new contexts.

Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

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Organizational issues**Institutions:**

KIT IAR - H²T Prof. T. Asfour, University of Stuttgart, University of Tübingen

This interdisciplinary seminar is conducted in cooperation with the University of Stuttgart and the University of Tübingen.

Competency certificate:

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). It includes a report of about two pages and a video presentation of about five minutes.

Recommendations:

Programming skills in C++, Python or Matlab are recommended.

Attendance of the lectures *Robotics I – Introduction to Robotics*, *Robotics II – Humanoid Robotics*, *Robotics III – Sensors and Perception in Robotics*, *Mechano-Informatics and Robotics* and *Wearable Robot Technologies* is recommended.

Workload:

90 h

- approx. 30 h attendance time
- approx. 15 h group project
- approx. 20 h literature review
- approx. 20 h written paper
- approx. 5 h preparation of video podcast

**Neural Networks and Artificial Intelligence**2400130, SS 2026, 2 SWS, [Open in study portal](#)**Seminar (S)**

Content**Inhalt (EN):**

In many tasks that appear natural to us, the fastest computers are unable to match the performance of the human brain. Neural networks attempt to simulate the parallel and distributed architecture of the brain in order to master these skills with learning algorithms. In this context, focus is being put on neural network approaches to computer vision and speech recognition, robotics and other areas.

In this seminar students will acquaint themselves with literature from provided topics and will present their results as a talk supported by slides to the other participants of the seminar.

Recommendations:

- Finishing the module "Kognitive Systeme" prior to the seminar is recommended.
- Attending the lecture "Deep Learning und Neuronale Netze" prior to the seminar is of advantage

**Embedded Machine Learning**2400137, SS 2026, SWS, Language: German/English, [Open in study portal](#)**Seminar (S)**
Blended (On-Site/Online)**Content**

In our seminars, students learn about cutting-edge research in the research fields presented below. Students are offered topics by the supervisors, but also can suggest their own topics in these fields. The seminar is offered in both English and German.

Machine learning on on-chip systems

Machine learning and on-chip systems form a symbiosis where each research area benefits from advances in the other. In this seminar, students review cutting-edge research on both areas.

Machine learning (ML) gains importance in all aspects of information systems. From high-level algorithms like image recognition to lower-level intelligent CPU management - ML is ubiquitous. On-chip systems also benefit from advances in ML techniques. Examples include adaptive resource management or workload prediction. However, ML techniques also benefit from advances in on-chip systems. A prominent example is acceleration of neural networks in recent desktop GPUs and even smartphone chips.

In this seminar, students will review cutting-edge state-of-the-art research (publications) on a specific topic related to ML on on-chip systems. The findings will be summarized in a seminar report and presented to the other members of the course. Students are welcome to suggest their own topics, but this is not required. The seminar can be held in English or German.

Approximate Computing for Efficient Machine Learning

Nowadays, energy efficiency is a first-class design constraint in the ICT sector. Approximate computing emerges as a new design paradigm for generating energy efficient computing systems. There is a large body of resource-hungry applications (eg, image processing and machine learning) that exhibit an intrinsic resilience to errors and produce outputs that are useful and of acceptable quality for the users despite their underlying computations being performed in an approximate manner. By exploiting this inherent error tolerance of such applications, approximate computing trades computational accuracy for savings in other metrics, eg, energy consumption and performance. Machine learning, a very common and top trending workload of both data centers and embedded systems, is a perfect candidate for approximate computing application since, by definition, it delivers approximate results. Performance as well as energy efficiency (especially in the case of embedded systems) are crucial for machine learning applications and thus, approximate computing techniques are widely adopted in machine learning (eg, TPU) to improve its energy profile as well as performance.

Machine Learning methods for DNN compilation and mapping

Deep neural networks have achieved great success in challenging tasks such as image classification and object detection. There is a great demand for deploying these networks in different devices, ranging from cloud servers to embedded devices.

Mapping DNNs to these devices is a challenging task since each of these devices has different characteristics in terms of memory organization, compute units, etc. . There have been efforts to automate the process of mapping/compiling DNNs to hardware with different characteristics.

In this seminar, we will discuss the efforts that have been done in mapping/compiling DNNs over hardware using machine learning methods.

Organizational issues

Please register in ILIAS to participate.

**Embedded Security and Architectures**2400148, SS 2026, SWS, Language: German/English, [Open in study portal](#)**Seminar (S)**
Blended (On-Site/Online)

Content

In our seminars, students learn about cutting-edge research in the research fields presented below. Students are offered topics by the supervisors, but also can suggest their own topics in these fields. The seminar is offered in both English and German.

Dependability for Reconfigurable Architectures

Dependability has become one of the prime concerns in recent nano-era. Reliability (the ability of the system to deliver services as specified) and Security (the ability of the system to protect itself against deliberate or accidental intrusion) are the two crucial attributes of dependable systems. Among the other reliability threats due to physical limits of CMOS technology, radiation induced soft errors or transient faults are also the most challenging threat to be handled. During this seminar, we will explore state-of-the-art for the power-efficient soft-error reliability and study different research solutions to improve soft-error resiliency in power efficient manner leveraging power-performance-reliability trade-offs. During this seminar, the students will also be able to understand hardware security in reconfigurable architectures,

Thermal and Power Aware Embedded Systems

Power densities are continuously increasing along with technology scaling and the integration of more transistors into smaller areas, potentially resulting in thermal emergencies on the chip. To mitigate such emergencies, power and thermal management techniques are employed. The state-of-the-art power and thermal management techniques can be classified into several categories, such as reactive and proactive techniques, centralized and distributed ones. Recently, machine learning algorithms are employed in power and thermal management techniques to make them more proactive and adaptive. Those various categories of the state-of-the-art techniques need to be reviewed in this seminar to demonstrate the advantage and disadvantage of each of them.

Security of Reconfigurable Embedded Systems

Various types of (re)configurable systems have emerged in recent years. The spectrum ranges from one-time configurable systems that are programmed at the design time for product-specific requirements, to reconfigurable systems that can also be adapted after commissioning, to dynamically reconfigurable systems whose configuration can be changed at runtime and their ability to dynamic reconfiguration is an important part of their system functionality.

This seminar focuses on the runtime reconfigurable systems, their security aspects and methods. It investigates the current state of research for securing the runtime reconfigurable systems, as well as the feasibility of using the security measures from general processing architectures to runtime reconfigurable systems.

Security in Resource Management

Efficient resource management in many-core systems (ie, systems with more than 100 cores, not only a dozen) has become a research challenge in the last years. As complexity and the demand for scalability increase, this new paradigm should also consider new security features to avoid or mitigate the effects of malicious applications both on critical information and the system as a whole.

In this seminar, we will focus on the state-of-the-art of security attacks such as Side Channel Attacks (SCA), Covert channel attacks, as well as other similar resource-based attacks and their effects on other critical applications running on many-core systems. During this seminar, student will dive into the security aspects of resource management, while investigating answers to the following research questions:

- How do these attacks work?
- Which are the associated vulnerabilities? What resources are vulnerable?
- What's their impact on critical information or other resources?
- What are the current countermeasures for the attacks?

Organizational issues

Please register in ILIAS to participate.



Advanced Topics in Natural Language Processing

2400217, SS 2026, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

Content

This seminar covers the newest developments in natural language processing (NLP) research, designed for students passionate about applied artificial intelligence.

The seminar consists of two phases:

1. Research Exploration Phase: Presentations by our lab members or invited external speakers on recent NLP research papers. The students will participate in interactive discussions.
2. Student Presentation Phase: Presentations of selected research papers by the students.

The seminar is graded based on the **final presentations** and active **participation** in discussions. No written report is required.

Please do not join this seminar and our other seminar "Speech-to-Speech Translation" in parallel.

Organizational issues

R 223, Geb. 50.20

**Seminar: Hot Topics in Explainable Artificial Intelligence (XAI)**24005, SS 2026, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)**
On-Site**Content**

This seminar is concerned with explainable machine learning in computer security. Learning-based systems often are difficult to interpret, and their decisions are opaque to practitioners. This lack of transparency is a considerable problem in computer security, as black-box learning systems are hard to audit and protect from attacks.

The module introduces students to the emerging field of explainable machine learning and teaches them to work up results from recent research. To this end, the students will read up on a sub-field, prepare a seminar report, and present their work at the end of the term to their colleagues.

Topics cover different aspects of the explainability of machine learning methods for the application in computer security in particular.

Organizational issues

English Course

**Advanced Methods of Information Fusion**24344, SS 2026, 2 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)**
On-Site**Content**

The growing spread and performance of modern information and communication technologies produces an ever-increasing amount of data. It is one of the central challenges of our time to extract meaningful information from these data sets. The approach to address these issues, often called data science, combines strategies and methods from the fields of machine learning, mathematics, state estimation, visualization and pattern recognition. During this seminar, the students will familiarize themselves with concepts and methods particularly focusing on estimation theory and its application.

The seminar targets master students in computer science and bachelor students in Information engineering and management.

**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.

**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.

**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

T**6.143 Module component: Seminar: Designing and Conducting Experimental Studies [T-INFO-106112]****Coordinators:** Prof. Dr.-Ing. Michael Beigl**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-103078 - Seminar: Designing and Conducting Experimental Studies](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	4 CP	graded	Irregular	1

Exams			
WT 25/26	7500239	Seminar: Designing and Conducting Experimental Studies	Beigl

T**6.144 Module component: Seminar: Advanced Algorithms in Computer Graphics [T-INFO-105664]****Coordinators:** Prof. Dr.-Ing. Carsten Dachsbacher**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-102729 - Seminar: Advanced Algorithms in Computer Graphics](#)**Type**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Each winter term**Version**
1

Courses					
WT 25/26	2400006	Seminar Fortgeschrittene Algorithmen in der Computergrafik	2 SWS	Seminar / 	Schudeiske, Dachsbacher
ST 2026	2424816	Seminar Fortgeschrittene Algorithmen in der Computergrafik	2 SWS	Seminar / 	Alber, Dachsbacher
Exams					
WT 25/26	7500193	Seminar: Advanced Algorithms in Computer Graphics	Dachsbacher		

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.145 Module component: Seminar: Advanced Topics in Natural Language Processing [T-INFO-114433]**Coordinators:** Prof. Dr. Jan Niehues**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-107353 - Seminar: Advanced Topics in Natural Language Processing](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	Graded	Each term	1

Courses					
WT 25/26	2400074	Advanced Topics in Natural Language Processing	2 SWS	Seminar	Niehues, Li
ST 2026	2400217	Advanced Topics in Natural Language Processing	2 SWS	Seminar	Niehues
Exams					
WT 25/26	7500267	Seminar Advanced Topics in Natural Language Processing			Niehues

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A written paper must be prepared and a presentation given. Withdrawal is possible within two weeks of the topic being assigned.

Prerequisites

None.

Recommendations

Knowledge from the lectures Machine Translation and Cognitive Systems

Below you will find excerpts from courses related to this module component:

V

Advanced Topics in Natural Language Processing

2400074, WS 25/26, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

Content

Seminar: Advanced Topics in Machine Translation

Machine translation has now made it possible to automatically translate both written text and spoken language into another language. In neural machine translation, methods from machine learning are primarily used to model the translation process.

In the seminar, current research results on various aspects of the systems will be discussed. For this purpose, publications from the areas selected by the participants will be presented. Possible topics include use of Transformer-trained models and large language models (LLMs), multilingualism, new methods of deep learning for translation, quality estimation and integration of additional context.

Requirements:

Prior knowledge from the "Machine Translation" lecture is an advantage.

Lecture language is English.

Organizational issues

Raum 223, Geb. 50.20

V

Advanced Topics in Natural Language Processing

2400217, SS 2026, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

Content

This seminar covers the newest developments in natural language processing (NLP) research, designed for students passionate about applied artificial intelligence.

The seminar consists of two phases:

1. Research Exploration Phase: Presentations by our lab members or invited external speakers on recent NLP research papers. The students will participate in interactive discussions.
2. Student Presentation Phase: Presentations of selected research papers by the students.

The seminar is graded based on the **final presentations** and active **participation** in discussions. No written report is required.

Please do not join this seminar and our other seminar "Speech-to-Speech Translation" in parallel.

Organizational issues

R 223, Geb. 50.20

T**6.146 Module component: Seminar: Advanced Topics on SAT Solving [T-INFO-114231]**

Coordinators: Dr. Ashlin Iser
Prof. Dr. Peter Sanders

Organisation: KIT Department of Informatics

Part of: [M-INFO-107209 - Seminar: Advanced Topics on SAT Solving](#)

Type
Examination of another type

Credits
3 CP

Grading
graded

Term offered
Each winter term

Version
1

Courses					
WT 25/26	2400020	Advanced Topics in SAT Solving	2 SWS	Seminar / 	Sanders, Iser, Schreiber
Exams					
WT 25/26	7500041	Seminar: Advanced Topics on SAT Solving			Sanders

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A presentation must be given. Withdrawal is possible within two weeks of the topic being assigned.

Prerequisites

None.

Recommendations

Knowledge of the basics from "SAT Solving in Practice" is helpful.

T**6.147 Module component: Seminar: AI Systems Engineering [T-INFO-112881]**

Coordinators: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: [M-INFO-106356 - Seminar: AI Systems Engineering](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	4 CP	graded	Irregular	1

T**6.148 Module component: Seminar: Algorithm Engineering [T-INFO-112312]****Coordinators:** Prof. Dr. Peter Sanders**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-106086 - Seminar: Algorithm Engineering](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	4 CP	graded	Irregular	1

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A written paper must be prepared and a presentation given. Withdrawal is possible within two weeks of the topic being assigned.

Prerequisites

None.

Recommendations

Knowledge of algorithms is an advantage. Exemplary lectures are Algorithms I, Algorithms II, Algorithm Engineering and Parallel Algorithms.

T**6.149 Module component: Seminar: Artificial Intelligence for Energy Systems [T-INFO-113110]**

Coordinators: TT-Prof. Dr. Benjamin Schäfer
Organisation: KIT Department of Informatics
Part of: [M-INFO-106490 - Seminar: Artificial Intelligence for Energy Systems](#)

Type
Examination of another type

Credits
4 CP

Grading
graded

Term offered
Each winter term

Version
1

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO), consisting of a Term paper (max. 15 pages) and a Presentation (duration approx. 30 min.)

The grading scale will be announced in the course.

Students may redraw from the examination during the first two weeks after the topic has been communicated. The assessment can be repeated once.

Prerequisites

None.

Recommendations

Previous participation in “Energieinformatik 1” and/or “Energieinformatik 2” is beneficiary but not mandatory.

T**6.150 Module component: Seminar: Computer Science TECO [T-INFO-110808]**

Coordinators: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: [M-INFO-105328 - Seminar: Computer Science TECO](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Irregular	2

T

6.151 Module component: Seminar: Critical Topics in AI [T-INFO-113915]**Coordinators:** Prof. Dr. Pascal Friederich**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-106958 - Seminar: Critical Topics in AI](#)**Type**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Each summer term**Version**
1

Courses					
WT 25/26	2400231	Seminar: Critical topics in AI	2 SWS	Seminar / 	Friederich, Zhou, Torresi, Neubert, Eberhard, Schlöder
ST 2026	2400215	Seminar: Critical topics in AI	2 SWS	Seminar / 	Friederich, Torresi, Neubert, Schlöder, Metni
Exams					
WT 25/26	7500407	Seminar: Critical topics in AI	Friederich		

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). The following partial aspects are included in the grading: Term paper (approx. 10-15 pages), presentation (duration 30+15 min.). The grading scale will be announced in the course. Students may redraw from the examination during the first two weeks after the topic has been communicated. The assessment can be repeated once.

Prerequisites

Basic knowledge in AI and Machine Learning, e.g.

- BA Informatics: Introduction to artificial intelligence

Recommendations

Interest in social topics and research questions is required

T

6.152 Module component: Seminar: Deep Learning for Robotics [T-INFO-114204]

Coordinators: Prof. Dr. Gerhard Neumann
Organisation: KIT Department of Informatics
Part of: [M-INFO-107175 - Seminar: Deep Learning for Robotics](#)

Type
Examination of another type

Credits
3 CP

Grading
graded

Term offered
Each winter term

Version
1

Courses					
WT 25/26	2400099	Deep Learning for Robotics	2 SWS	Seminar / 	Neumann
Exams					
WT 25/26	7500306	Seminar: Deep Learning for Robotics			Neumann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

Presentation on the chosen topic at the end of the semester and written elaboration

Withdrawal is possible within two weeks of the topic being assigned.

Prerequisites

None.

Recommendations

Attendance of the lecture "Machine Learning - Fundamentals and Algorithms" is recommended.

Below you will find excerpts from courses related to this module component:

V

Deep Learning for Robotics

2400099, WS 25/26, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)
On-Site

Content

Each student has to choose one of the offered topics from the area of deep learning / robot learning / deep reinforcement learning / deep imitation learning.

Each topic consists of several research papers for which the students have to prepare a presentation as well as a report in form of a scientific research paper.

It is recommended to take the seminar together with the "Research Project Deep Learning for Robotics", where the presented algorithms will be implemented and evaluated.

Students will work in teams of 2.

Students are able to independently understand a complex research topic, present the content in a concise and understandable way and prepare a scientific report summarizing the topic.

Students are able to independently understand a complex research topic, present the content in a concise and understandable way and prepare a scientific report summarizing the topic. Students get a deeper understanding of state-of-the-art learning algorithms and get to know current research challenges.

Vortrag zum gewählten Thema am Ende des Semesters und schriftliche Ausarbeitung.

Der Besuch der Vorlesung „Maschinelles Lernen - Grundlagen und Algorithmen“ ist empfehlenswert.

Organizational issues

Mehr Informationen in ILIAS

T

6.153 Module component: Seminar: Embedded Systems I [T-INFO-114255]**Coordinators:** Prof. Dr.-Ing. Jörg Henkel**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-107231 - Seminar: Embedded Systems I](#)**Type**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Each term**Version**
1

Courses					
WT 25/26	2400137	Embedded Machine Learning Seminar		Seminar / 	Sikal, Ahmed, Dietrich, Demirdag, Henkel, Khdr, Mentzos
WT 25/26	2400148	Embedded Security and Architectures		Seminar / 	Nassar, Khdr, Sikal, Henkel, Alsharkawy, Tobar
ST 2026	2400137	Embedded Machine Learning		Seminar / 	Henkel, Sikal, Khdr, Ahmed, Demirdag, Mentzos
ST 2026	2400148	Embedded Security and Architectures		Seminar / 	Henkel, Nassar, Khdr, Sikal, Tobar, Alsharkawy, Dietrich
Exams					
WT 25/26	7500346	CES - Seminar: Embedded Systems: Embedded Security and Architectures			Henkel
WT 25/26	7500349	CES - Seminar: Embedded Machine Learning			Henkel

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). A written paper must be prepared and a presentation given. Withdrawal is possible within two weeks of the topic being assigned.

Prerequisites

None.

Recommendations

Knowledge of IoT and embedded systems

Below you will find excerpts from courses related to this module component:

V

Embedded Machine Learning Seminar2400137, WS 25/26, SWS, Language: German/English, [Open in study portal](#)**Seminar (S)**
Blended (On-Site/Online)

Content

In our seminars, students learn about cutting-edge research in the research fields presented below. Students are offered topics by the supervisors, but also can suggest their own topics in these fields. The seminar is offered in both English and German.

Machine Learning on On-Chip Systems

Machine learning and on-chip systems form a symbiosis where each research area benefits from advances in the other. In this seminar, students review cutting-edge research on both areas.

Machine learning (ML) gains importance in all aspects of information systems. From high-level algorithms like image recognition to lower-level intelligent CPU management - ML is ubiquitous. On-chip systems also benefit from advances in ML techniques. Examples include adaptive resource management or workload prediction. However, ML techniques also benefit from advances in on-chip systems. A prominent example is acceleration of neural networks in recent desktop GPUs and even smartphone chips.

In this seminar, students will review cutting-edge state-of-the-art research (publications) to a specific topic related to ML on on-chip systems. The findings will be summarized in a seminar report and presented to the other members of the course. Students are welcome to suggest own topics, but this is not required. The seminar can be held in English or German.

DNN Pruning and Quantization

As DNNs become more computationally hungry, their hardware implementation becomes more challenging, since embedded devices have limited resources. DNN compression techniques, such as pruning and quantization, can be applied for efficient utilization of computational resources. While pruning involves removing unimportant elements of a DNN structure (connections, filters, channels etc), quantization decreases the precision for representing DNN-related tensors (weights and activations). Both promise to trade-off some of the application's accuracy for limited energy consumption and reduced memory footprint. Students will review state-of-the-art research works on hardware-aware DNN pruning and quantization. The findings will be summarized in a seminar report and presented to the other members of the course.

Organizational issues

Bitte im ILIAS zur Teilnahme anmelden.

**Embedded Security and Architectures**

2400148, WS 25/26, SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
Blended (On-Site/Online)

Content

In our seminars, students learn about cutting-edge research in the research fields presented below. Students are offered topics by the supervisors, but also can suggest their own topics in these fields. The seminar is offered in both English and German.

Dependability for Reconfigurable Architectures

Dependability has become one of the prime concerns in recent nano-era. Reliability (the ability of the system to deliver services as specified) and Security (the ability of the system to protect itself against deliberate or accidental intrusion) are the two crucial attributes of dependable systems. Among the other reliability threats due to physical limits of CMOS technology, radiation induced soft errors or transient faults are also the most challenging threat to be handled. During this seminar, we will explore state-of-the-art for the power-efficient soft-error reliability and study different research solutions to improve soft-error resiliency in power efficient manner leveraging power-performance-reliability trade-offs. During this seminar, the students will also be able to understand hardware security in reconfigurable architectures,

Thermal and Power Aware Embedded Systems

Power densities are continuously increasing along with technology scaling and the integration of more transistors into smaller areas, potentially resulting in thermal emergencies on the chip. To mitigate such emergencies, power and thermal management techniques are employed. The state-of-the-art power and thermal management techniques can be classified into several categories, such as reactive and proactive techniques, centralized and distributed ones. Recently, machine learning algorithms are employed in power and thermal management techniques to make them more proactive and adaptive. Those various categories of the state-of-the-art techniques need to be reviewed in this seminar to demonstrate the advantage and disadvantage of each of them.

Security of Reconfigurable Embedded Systems

Various types of (re) configurable systems have emerged in recent years. The spectrum ranges from one-time configurable systems that are programmed at the design time for product-specific requirements, to reconfigurable systems that can also be adapted after commissioning, to dynamically reconfigurable systems whose configuration can be changed at runtime and their ability to dynamic reconfiguration is an important part of their system functionality.

This seminar focuses on the runtime reconfigurable systems, their security aspects and methods. It investigates the current state of research for securing the runtime reconfigurable systems, as well as the feasibility of using the security measures from general processing architectures to runtime reconfigurable systems.

Security in Resource Management

Efficient resource management in many-core systems (ie, systems with more than 100 cores, not only a dozen) has become a research challenge in the last years. As complexity and the demand for scalability increase, this new paradigm should also consider new security features to avoid or mitigate the effects of malicious applications both on critical information and the system as a whole.

In this seminar, we will focus on the state-of-the-art of security attacks such as Side Channel Attacks (SCA), Covert channel attacks, as well as other similar resource-based attacks and their effects on other critical applications running on many-core systems. During this seminar, student will dive into the security aspects of resource management, while investigating answers to the following research questions:

- How do these attacks work?
- Which are the associated vulnerabilities? What resources are vulnerable?
- What's their impact on critical information or other resources?
- What are the current countermeasures for the attacks?

Organizational issues

Please register in ILIAS to participate.



Embedded Machine Learning

2400137, SS 2026, SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
Blended (On-Site/Online)

Content

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Machine learning and on-chip systems form a symbiosis where each research area benefits from advances in the other. In this seminar, students review cutting-edge research on both areas.

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In this seminar, students will review cutting-edge state-of-the-art research (publications) on a specific topic related to ML on on-chip systems. The findings will be summarized in a seminar report and presented to the other members of the course. Students are welcome to suggest their own topics, but this is not required. The seminar can be held in English or German.

Approximate Computing for Efficient Machine Learning

Nowadays, energy efficiency is a first-class design constraint in the ICT sector. Approximate computing emerges as a new design paradigm for generating energy efficient computing systems. There is a large body of resource-hungry applications (eg, image processing and machine learning) that exhibit an intrinsic resilience to errors and produce outputs that are useful and of acceptable quality for the users despite their underlying computations being performed in an approximate manner. By exploiting this inherent error tolerance of such applications, approximate computing trades computational accuracy for savings in other metrics, eg, energy consumption and performance. Machine learning, a very common and top trending workload of both data centers and embedded systems, is a perfect candidate for approximate computing application since, by definition, it delivers approximate results. Performance as well as energy efficiency (especially in the case of embedded systems) are crucial for machine learning applications and thus, approximate computing techniques are widely adopted in machine learning (eg, TPU) to improve its energy profile as well as performance.

Machine Learning methods for DNN compilation and mapping

Deep neural networks have achieved great success in challenging tasks such as image classification and object detection. There is a great demand for deploying these networks in different devices, ranging from cloud servers to embedded devices.

Mapping DNNs to these devices is a challenging task since each of these devices has different characteristics in terms of memory organization, compute units, etc. . There have been efforts to automate the process of mapping/compiling DNNs to hardware with different characteristics.

In this seminar, we will discuss the efforts that have been done in mapping/compiling DNNs over hardware using machine learning methods.

Organizational issues

Please register in ILIAS to participate.



Embedded Security and Architectures

2400148, SS 2026, SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
Blended (On-Site/Online)

Content

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Thermal and Power Aware Embedded Systems

Power densities are continuously increasing along with technology scaling and the integration of more transistors into smaller areas, potentially resulting in thermal emergencies on the chip. To mitigate such emergencies, power and thermal management techniques are employed. The state-of-the-art power and thermal management techniques can be classified into several categories, such as reactive and proactive techniques, centralized and distributed ones. Recently, machine learning algorithms are employed in power and thermal management techniques to make them more proactive and adaptive. Those various categories of the state-of-the-art techniques need to be reviewed in this seminar to demonstrate the advantage and disadvantage of each of them.

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This seminar focuses on the runtime reconfigurable systems, their security aspects and methods. It investigates the current state of research for securing the runtime reconfigurable systems, as well as the feasibility of using the security measures from general processing architectures to runtime reconfigurable systems.

Security in Resource Management

Efficient resource management in many-core systems (ie, systems with more than 100 cores, not only a dozen) has become a research challenge in the last years. As complexity and the demand for scalability increase, this new paradigm should also consider new security features to avoid or mitigate the effects of malicious applications both on critical information and the system as a whole.

In this seminar, we will focus on the state-of-the-art of security attacks such as Side Channel Attacks (SCA), Covert channel attacks, as well as other similar resource-based attacks and their effects on other critical applications running on many-core systems. During this seminar, student will dive into the security aspects of resource management, while investigating answers to the following research questions:

- How do these attacks work?
- Which are the associated vulnerabilities? What resources are vulnerable?
- What's their impact on critical information or other resources?
- What are the current countermeasures for the attacks?

Organizational issues

Please register in ILIAS to participate.

T

6.154 Module component: Seminar: Embedded Systems II [T-INFO-114256]

Coordinators: Prof. Dr.-Ing. Jörg Henkel
Organisation: KIT Department of Informatics
Part of: [M-INFO-107232 - Seminar: Embedded Systems II](#)

Type
Examination of another type

Credits
3 CP

Grading
graded

Term offered
Each term

Version
1

Courses					
ST 2026	2400137	Embedded Machine Learning		Seminar / 	Henkel, Sikal, Khdr, Ahmed, Demirdag, Mentzos
ST 2026	2400148	Embedded Security and Architectures		Seminar / 	Henkel, Nassar, Khdr, Sikal, Tobar, Alsharkawy, Dietrich

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). A written paper must be prepared and a presentation given. Withdrawal is possible within two weeks of the topic being assigned.

Prerequisites

None.

Recommendations

Knowledge of IoT and embedded systems

Additional Information

This is identical to the module 'Seminars: Embedded Systems I' and enables participation in a second seminar at the CES Chair.

Below you will find excerpts from courses related to this module component:

V

Embedded Machine Learning

2400137, SS 2026, SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
Blended (On-Site/Online)

Content

In our seminars, students learn about cutting-edge research in the research fields presented below. Students are offered topics by the supervisors, but also can suggest their own topics in these fields. The seminar is offered in both English and German.

Machine learning on on-chip systems

Machine learning and on-chip systems form a symbiosis where each research area benefits from advances in the other. In this seminar, students review cutting-edge research on both areas.

Machine learning (ML) gains importance in all aspects of information systems. From high-level algorithms like image recognition to lower-level intelligent CPU management - ML is ubiquitous. On-chip systems also benefit from advances in ML techniques. Examples include adaptive resource management or workload prediction. However, ML techniques also benefit from advances in on-chip systems. A prominent example is acceleration of neural networks in recent desktop GPUs and even smartphone chips.

In this seminar, students will review cutting-edge state-of-the-art research (publications) on a specific topic related to ML on on-chip systems. The findings will be summarized in a seminar report and presented to the other members of the course. Students are welcome to suggest their own topics, but this is not required. The seminar can be held in English or German.

Approximate Computing for Efficient Machine Learning

Nowadays, energy efficiency is a first-class design constraint in the ICT sector. Approximate computing emerges as a new design paradigm for generating energy efficient computing systems. There is a large body of resource-hungry applications (eg, image processing and machine learning) that exhibit an intrinsic resilience to errors and produce outputs that are useful and of acceptable quality for the users despite their underlying computations being performed in an approximate manner. By exploiting this inherent error tolerance of such applications, approximate computing trades computational accuracy for savings in other metrics, eg, energy consumption and performance. Machine learning, a very common and top trending workload of both data centers and embedded systems, is a perfect candidate for approximate computing application since, by definition, it delivers approximate results. Performance as well as energy efficiency (especially in the case of embedded systems) are crucial for machine learning applications and thus, approximate computing techniques are widely adopted in machine learning (eg, TPU) to improve its energy profile as well as performance.

Machine Learning methods for DNN compilation and mapping

Deep neural networks have achieved great success in challenging tasks such as image classification and object detection. There is a great demand for deploying these networks in different devices, ranging from cloud servers to embedded devices.

Mapping DNNs to these devices is a challenging task since each of these devices has different characteristics in terms of memory organization, compute units, etc. . There have been efforts to automate the process of mapping/compiling DNNs to hardware with different characteristics.

In this seminar, we will discuss the efforts that have been done in mapping/compiling DNNs over hardware using machine learning methods.

Organizational issues

Please register in ILIAS to participate.



Embedded Security and Architectures

2400148, SS 2026, SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
Blended (On-Site/Online)

Content

In our seminars, students learn about cutting-edge research in the research fields presented below. Students are offered topics by the supervisors, but also can suggest their own topics in these fields. The seminar is offered in both English and German.

Dependability for Reconfigurable Architectures

Dependability has become one of the prime concerns in recent nano-era. Reliability (the ability of the system to deliver services as specified) and Security (the ability of the system to protect itself against deliberate or accidental intrusion) are the two crucial attributes of dependable systems. Among the other reliability threats due to physical limits of CMOS technology, radiation induced soft errors or transient faults are also the most challenging threat to be handled. During this seminar, we will explore state-of-the-art for the power-efficient soft-error reliability and study different research solutions to improve soft-error resiliency in power efficient manner leveraging power-performance-reliability trade-offs. During this seminar, the students will also be able to understand hardware security in reconfigurable architectures,

Thermal and Power Aware Embedded Systems

Power densities are continuously increasing along with technology scaling and the integration of more transistors into smaller areas, potentially resulting in thermal emergencies on the chip. To mitigate such emergencies, power and thermal management techniques are employed. The state-of-the-art power and thermal management techniques can be classified into several categories, such as reactive and proactive techniques, centralized and distributed ones. Recently, machine learning algorithms are employed in power and thermal management techniques to make them more proactive and adaptive. Those various categories of the state-of-the-art techniques need to be reviewed in this seminar to demonstrate the advantage and disadvantage of each of them.

Security of Reconfigurable Embedded Systems

Various types of (re)configurable systems have emerged in recent years. The spectrum ranges from one-time configurable systems that are programmed at the design time for product-specific requirements, to reconfigurable systems that can also be adapted after commissioning, to dynamically reconfigurable systems whose configuration can be changed at runtime and their ability to dynamic reconfiguration is an important part of their system functionality.

This seminar focuses on the runtime reconfigurable systems, their security aspects and methods. It investigates the current state of research for securing the runtime reconfigurable systems, as well as the feasibility of using the security measures from general processing architectures to runtime reconfigurable systems.

Security in Resource Management

Efficient resource management in many-core systems (ie, systems with more than 100 cores, not only a dozen) has become a research challenge in the last years. As complexity and the demand for scalability increase, this new paradigm should also consider new security features to avoid or mitigate the effects of malicious applications both on critical information and the system as a whole.

In this seminar, we will focus on the state-of-the-art of security attacks such as Side Channel Attacks (SCA), Covert channel attacks, as well as other similar resource-based attacks and their effects on other critical applications running on many-core systems. During this seminar, student will dive into the security aspects of resource management, while investigating answers to the following research questions:

- How do these attacks work?
- Which are the associated vulnerabilities? What resources are vulnerable?
- What's their impact on critical information or other resources?
- What are the current countermeasures for the attacks?

Organizational issues

Please register in ILIAS to participate.

T

6.155 Module component: Seminar: Energy Informatics [T-INFO-106270]

Coordinators: Prof. Dr. Veit Hagenmeyer
Organisation: KIT Department of Informatics
Part of: [M-INFO-103153 - Seminar: Energy Informatics](#)

Type
Examination of another type

Credits
4 CP

Grading
graded

Term offered
Irregular

Version
1

Courses					
WT 25/26	2400013	Seminar: Energy Informatics	2 SWS	Seminar / 	Hagenmeyer, Schmurr, Langner, Rapp
Exams					
WT 25/26	7500175	Seminar: Energy Informatics			Hagenmeyer, Bläsius

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment of success is graded through the preparation of a written seminar paper and the presentation of the same as a different type of assessment in accordance with § 4 Para. 2 No. 3 SPO.

Prerequisites

None.

Recommendations

Knowledge of the basics of graph theory, algorithm technology and energy informatics is helpful.

Additional Information

This module is offered at irregular intervals.

Below you will find excerpts from courses related to this module component:

V

Seminar: Energy Informatics

2400013, WS 25/26, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
On-Site

Content

Energy informatics is a young field of research at the interface of electrical engineering, computer science, economics and law, in which questions about energy systems are dealt with. Issues arising from climate change and the increasing use of renewable energy sources are of particular interest.

In the "Energy Informatics" seminar, we look at selected issues arising from current research. These questions consider, for example, modeling, algorithms or simulations in the context of energy systems.

This seminar is aimed at Master's students in subjects that overlap with energy informatics, for example computer science, mechanical engineering, information systems, econometrics, business engineering or economics engineering. If you have any questions regarding credit transfer, please contact your study program service.

Ideally, students should have an in-depth insight into the subject areas of energy informatics and have basic knowledge of modeling, simulation and algorithms.

Other participants: Prof. Dr. Veit Hagenmeyer, T.T.-Prof. Dr. Thomas Bläsius

Workload: 4 CP corresponds to approx. 120 hours, approx. 21 hours attending the seminar, approx. 45 hours analyzing and working on the topic, approx. 27 hours preparing and creating the presentation and approx. 27 hours writing the paper.

Learning objectives: Based on a given topic, participants identify, collect and evaluate relevant literature. They classify the topic within the subject area of "energy informatics".

Participants prepare a seminar paper and take format specifications into account. Students critically examine other seminar papers and write reviews of the seminar papers of others.

In presentations, the participants present the most important content of their seminar paper in an auditorium-friendly manner and discuss it with the audience.

T

6.156 Module component: Seminar: Exoskeletons & Motion Capture [T-INFO-113892]**Coordinators:** Prof. Dr. Katja Mombaur**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-106927 - Seminar: Exoskeletons & Motion Capture](#)**Type**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Each winter term**Version**
1

Courses					
WT 25/26	2400187	Seminar: Exoskeletons & Motion Capture	2 SWS	Seminar / 	Mombaur, Lau
Exams					
WT 25/26	7500161	Seminar: Exoskeletons & Motion Capture			Mombaur

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

This includes the preparation of a term paper in form of a scientific paper (6 pages double column) an oral presentation with slides (30 Min + 15 Min discussion). Students may redraw from the examination during the first two weeks after the topic has been communicated.

Participation in the block seminar is mandatory.

Students have to actively participate in all discussions.

Prerequisites

None.

Recommendations

Knowledge in Robotics (e.g. from the class Robotics 1 and follow-ups) is helpful

Below you will find excerpts from courses related to this module component:

V

Seminar: Exoskeletons & Motion Capture

2400187, WS 25/26, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
On-Site

Content

This seminar provides insight into the current state of research and practical application of exoskeletons in medicine and their potential to improve the quality of life for people with and without physical impairments. On the other hand, there is an overview of various motion capture technologies, such as devices and methods for recording human movement, which play an important role in exoskeletons but have many other applications. Exoskeletons—also known as wearable robots—are used to improve mobility and are worn directly on the body to support or completely replace muscle strength. One type of exoskeleton assists people with limited mobility in walking, standing, and other physical activities, enabling them to regain their independence and participate in everyday activities. Other types of exoskeletons are used by healthy people to prevent injuries in difficult working conditions. Motion capture applications span many disciplines in which human behavior and movement are of interest, such as sports science, biomechanics, medicine, psychology, etc., but they also play an important role in the creation of animated films and computer games. In robotics, and especially in the development of exoskeletons, they are important for analyzing human-robot interaction and improving robot design and control. Various motion capture technologies exist for recording movement kinematics, ground reaction forces, and muscle activity. The seminar topics cover the spectrum of different exoskeleton types and motion capture technologies. Procedure: In a session during the first week of the semester, the seminar topic and the individual presentation topics will be presented in detail and assigned to students according to their preferences. Over the course of the semester, students will conduct literature research under supervision and prepare a presentation and a corresponding paper. Since most of the academic literature is in English, the paper should also be written in English. Presentations can be given in either English or German and will take place in one or more block sessions in the last third of the semester. There are still a few places available in the seminar for master's students. If you are interested, please contact jan.lau@kit.edu. The topic presentation will take place this semester on November 5 at 2:00 p.m. in Seminar Room 2, InformatiKOM 1.

Organizational issues

Vorbesprechung am Mittwoch, den 23.10.24 um 14:00 im Seminarraum 2

T

6.157 Module component: Seminar: Explainable Artificial Intelligence [T-INFO-113115]**Coordinators:** TT-Prof. Dr. Rudolf Lioutikov**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-106497 - Seminar: Explainable Artificial Intelligence](#)**Type**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Each winter term**Version**
1

Courses					
WT 25/26	2400143	Seminar: Explainable Artificial Intelligence	2 SWS	Seminar / 	Lioutikov, Mattes, Li
Exams					
WT 25/26	7500384	Seminar: Explainable Artificial Intelligence			Lioutikov

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

Presentation on the chosen topic at the end of the semester and written paper.

Prerequisites

None.

Recommendations

We recommend taking this research project after attending the “Explainable Artificial Intelligence” lecture in the summer semester.

We highly recommend to take this seminar in combination with the “Explainable Artificial Intelligence” research project (Forschungspraktikum).

- Experience in Machine Learning is recommended, e.g. through prior coursework.
- The Computer Science Department offers several great lectures e.g., “Maschinelles Lernen - Grundlagen und Algorithmen” and “Deep Learning”
- A good mathematical background will be beneficial
- Python experience is recommended
- We will use the PyTorch deep learning library. Some prior knowledge in this is helpful but not necessary.

Additional Information

It is only possible to resign within two weeks after assignment of the topic.

T**6.158 Module component: Seminar: Exploring Robotics - Insights from Science Fiction, Research and Society [T-INFO-113398]****Coordinators:** TT-Prof. Dr. Barbara Bruno**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-106651 - Seminar: Exploring Robotics - Insights from Science Fiction, Research and Society](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	Graded	Each summer term	1

Courses					
ST 2026	2400161	Exploring Robotics: Insights from Science Fiction, Research and Society	2 SWS	Seminar / 	Bruno, Maure, Yang

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

The overall impression is evaluated. The following partial aspects are included in the grading: Term paper (approx. 6 pages in double-column format), Presentation (duration approx. 10+10 min.).

Prerequisites

None.

Recommendations

Knowledge of the content of modules Robotics I - Introduction to Robotics, Robotics II: Humanoid Robotics, Robotics III - Sensors and Perception in Robotics is helpful.

Below you will find excerpts from courses related to this module component:

V**Exploring Robotics: Insights from Science Fiction, Research and Society**2400161, SS 2026, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)
On-Site**

Content**Competency Goals**

The students gain experience with literature research on a current research topic. They explore, understand and compare different approaches to a selected scientific problem. The students are able to write a summary of their literature research in the form of a scientific publication in English and give a scientific talk on it.

Content

The students choose a topic from the field of robotics (e.g. remote control, behavior-based robotics, human-robot interaction, the "uncanny valley," natural language understanding, machine learning) and conduct a research on it that, building on literature findings, also includes and addresses the perspectives of society and the general media (as given by science fiction books, movies and games, as well as media and news outlets) and technology assessment (including social/societal expectations and needs, ethical implications, and risks/benefits analyses).

Students work under the guidance of a scientific supervisor. At the end of the semester, they present the results and write an elaboration in English in the form of a scientific publication.

Workload

Seminar with 2 SWS, 3 LP.

3 LP corresponds to approx. 90 hours, of which

approx. 45 hours of literature research

approx. 25 hrs. elaboration

approx. 10 hrs. preparation of presentation

approx. 10 hrs. compulsory attendance

Competency certificate

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). The overall impression is evaluated. The following partial aspects are included in the grading: Term paper (approx. 6 pages in double-column format), Presentation (duration approx. 10+10 min.).

T

6.159 Module component: Seminar: Failing Forward: Robotics, Critical Reading and the Making of Good Research [T-INFO-114604]**Coordinators:** TT-Prof. Dr. Barbara Bruno**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-107436 - Seminar: Failing Forward: Robotics, Critical Reading and the Making of Good Research](#)

Type	Credits	Grading	Term offered	Expansion	Version
Examination of another type	3 CP	graded	Each winter term	1 semesters	1

Courses					
WT 25/26	2400194	Failing Forward: Robotics, Critical Reading and the Making of Good Research - Seminar	2 SWS	Seminar / 	Bruno, Maure, Neef
Exams					
WT 25/26	7500389	Seminar: Failing Forward: Robotics, Critical Reading and the Making of Good Research			Bruno

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). The overall impression is evaluated. The following partial aspects are included in the grading: Term paper (approx. 6 pages in double-column format), Presentation (duration approx. 10+10 min.).

Prerequisites

None.

Below you will find excerpts from courses related to this module component:

V

Failing Forward: Robotics, Critical Reading and the Making of Good Research - Seminar (S)
2400194, WS 25/26, 2 SWS, Language: English, [Open in study portal](#) **On-Site**

Content

The students choose a topic from the field of human-robot interaction, e.g. attention modelling, socially-aware navigation, social gestures generation or metrics for HRI experiments. They conduct a literature research on this topic under the guidance of a scientific supervisor. At the end of the semester, they present the results and write an elaboration in English in the form of a scientific publication.

Competency Goals:

The students gain experience with literature research on a current research topic. They explore, understand and compare different approaches to a selected scientific problem. The students are able to write a summary of their literature research in the form of a scientific publication in English and give a scientific talk on it.

Organizational issues**Workload:**

Seminar with 2 SWS, 3 LP.

3 LP corresponds to approx. 90 hours, of which

approx. 45 hours of literature research

approx. 25 hrs. elaboration

approx. 10 hrs. preparation of presentation

approx. 10 hrs. compulsory attendance

Competency certificate:

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). The overall impression is evaluated. The following partial aspects are included in the grading: Term paper (approx. 6 pages in double-column format), Presentation (duration approx. 10+10 min.).

T**6.160 Module component: Seminar: From Big Data to Data Science: Advanced Methods of Information Fusion [T-INFO-101270]****Coordinators:** Prof. Dr.-Ing. Uwe Hanebeck**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-102305 - Seminar: From Big Data to Data Science: Advanced Methods of Information Fusion](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	Grading graded	Each term	1

Courses					
WT 25/26	2424344	Advanced Methods of Information Fusion	2 SWS	Seminar / 	Hanebeck
ST 2026	24344	Advanced Methods of Information Fusion	2 SWS	Seminar / 	Hanebeck
Exams					
WT 25/26	7500021	Advanced Methods of Information Fusion			Hanebeck
ST 2026	7500013	Advanced Methods of Information Fusion			Hanebeck

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Below you will find excerpts from courses related to this module component:

V**Advanced Methods of Information Fusion**2424344, WS 25/26, 2 SWS, Language: German, [Open in study portal](#)**Seminar (S)**
On-Site**Content**

The growing spread and performance of modern information and communication technologies produces an ever-increasing amount data. It is one of the central challenges of our time to extract meaningful information from these data sets. The approach to address these issues, often called data science, combines strategies and methods from the fields of machine learning, mathematics, state estimation, visualization and pattern recognition. During this seminar, the students will familiarize themselves with concepts and methods particularly focusing on estimation theory and its application

The seminar targets master students in computer science and bachelor students in Information engineering and management.

Organizational issues

Gemeinsame Einführungsveranstaltung von Proseminar 2424060 & Seminar 2424344 am 27.10.2025 in Raum 148, Gebäude 50.20.

V**Advanced Methods of Information Fusion**24344, SS 2026, 2 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)**
On-Site**Content**

The growing spread and performance of modern information and communication technologies produces an ever-increasing amount data. It is one of the central challenges of our time to extract meaningful information from these data sets. The approach to address these issues, often called data science, combines strategies and methods from the fields of machine learning, mathematics, state estimation, visualization and pattern recognition. During this seminar, the students will familiarize themselves with concepts and methods particularly focusing on estimation theory and its application

The seminar targets master students in computer science and bachelor students in Information engineering and management.

T

6.161 Module component: Seminar: Hot Topics in Artificial Intelligence & Security 1 [T-INFO-113761]**Coordinators:** Prof. Dr. Christian Wressnegger**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-106868 - Seminar: Hot Topics in Artificial Intelligence & Security 1](#)**Type**
Examination of another type**Credits**
4 CP**Grading**
graded**Term offered**
Each winter term**Version**
1

Courses					
WT 25/26	24004	Seminar: Hot Topics in Security of Machine Learning	2 SWS	Seminar / 	Wressnegger, Zhao
WT 25/26	24005	Seminar: Hot Topics in Cyber-Physical Systems Security	2 SWS	Seminar / 	Wressnegger
Exams					
WT 25/26	7500314	Seminar: Hot Topics in Security of Machine Learning			Wressnegger

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A written paper must be prepared and a presentation given. One repetition is possible.

Prerequisites

None.

Recommendations

The basics of IT security and artificial intelligence are a prerequisite.

Below you will find excerpts from courses related to this module component:

V

Seminar: Hot Topics in Security of Machine Learning

24004, WS 25/26, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
On-Site

Content

This seminar is concerned with the combination of artificial intelligence, machine learning and computer security in practice. Many tasks in the security landscape are based on manual labor, such as searching for vulnerabilities or analyzing malware. Here, machine learning can be used to establish a higher degree of automation, providing more "intelligent" security solutions (AI for Security). However, also these learning-based systems can be attacked and need to be secured (Security of AI).

This module is part of a seminar series to intensifies the contents of the AISEC lecture. It can be attended individually and in no particular order. The module puts focus on timely topics from recent research and teaches students to work up results from state-of-the-art research. To this end, they will read up on a sub-field, prepare a seminar report, and present their work at the end of the term to their colleagues.

Organizational issues

English Course

T

6.162 Module component: Seminar: Hot Topics in Artificial Intelligence & Security 2 [T-INFO-113762]**Coordinators:** Prof. Dr. Christian Wressnegger**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-106869 - Seminar: Hot Topics in Artificial Intelligence & Security 2](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	4 CP	Graded	Each summer term	1

Courses					
WT 25/26	24004	Seminar: Hot Topics in Security of Machine Learning	2 SWS	Seminar / 	Wressnegger, Zhao
WT 25/26	24005	Seminar: Hot Topics in Cyber-Physical Systems Security	2 SWS	Seminar / 	Wressnegger
Exams					
WT 25/26	7500317	Seminar: Hot Topics in Cyber-Physical Systems Security			Wressnegger

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A written elaboration must be prepared and a presentation must be given. Withdrawal is possible within two weeks after assignment of the topic. One repetition is possible.

Prerequisites

None.

Additional Information

The basics of IT security and artificial intelligence are a prerequisite.

Below you will find excerpts from courses related to this module component:

V

Seminar: Hot Topics in Security of Machine Learning

24004, WS 25/26, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
On-Site

Content

This seminar is concerned with the combination of artificial intelligence, machine learning and computer security in practice. Many tasks in the security landscape are based on manual labor, such as searching for vulnerabilities or analyzing malware. Here, machine learning can be used to establish a higher degree of automation, providing more "intelligent" security solutions (AI for Security). However, also these learning-based systems can be attacked and need to be secured (Security of AI).

This module is part of a seminar series to intensifies the contents of the AISEC lecture. It can be attended individually and in no particular order. The module puts focus on timely topics from recent research and teaches students to work up results from state-of-the-art research. To this end, they will read up on a sub-field, prepare a seminar report, and present their work at the end of the term to their colleagues.

Organizational issues

English Course

T

6.163 Module component: Seminar: Hot Topics in Bioinformatics [T-INFO-101287]

Coordinators: Prof. Dr. Alexandros Stamatakis
Organisation: KIT Department of Informatics
Part of: [M-INFO-100750 - Seminar: Hot Topics in Bioinformatics](#)

Type
Examination of another type

Credits
3 CP

Grading
graded

Term offered
Each summer term

Version
2

Courses					
ST 2026	2400011	Hot Topics in Bioinformatics	2 SWS	Seminar /	Stamatakis
Exams					
ST 2026	7500014	Seminar: Hot Topics in Bioinformatics			Stamatakis

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO). (Weighting of presentation and written report: 50% each)

Prerequisites

The exam in Introduction to Bioinformatics for Computer Scientists must have been passed in one of the preceding semesters.

Recommendations

Basic knowledge in the areas of theoretical computer science (algorithms, data structures) and technical computer science (sequential optimisation in C or C++, computer architectures, parallel programming, vector processors) will be beneficial.

Below you will find excerpts from courses related to this module component:

V

Hot Topics in Bioinformatics

2400011, SS 2026, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)
On-Site

Content

Prerequisites: CS Master's level seminar. Participants must have attended and passed the course on "Introduction to Bioinformatics for Computer Scientists" in one of the preceding winter terms.

Task: You will need to select papers to present, give a presentation and write a report.

This main seminar allows students to understand and present the contents of current papers in Bioinformatics such as published for instance in the journals *Bioinformatics*, *BMC Bioinformatics*, *Journal of Computational Biology* etc. or at conferences such as *ISMB* or *RECOMB*.

We will provide a list of interesting papers, but students can also propose papers they are interested in. Students may also choose to cover broader topics of more general interest such as multiple sequence alignment, Bayesian phylogenetic inference, read assembly etc.

Each student will be assigned a lab member for help with understanding the article and preparing the slides as well as the report.

Students should give a 35 minute presentation on their topic of choice and write a report (Seminararbeit) comprising 8 pages.

Goals: Participants are able to understand, critically assess, and compare current research papers in Bioinformatics. They are able to present algorithms and models from current research papers in oral and written form at a level that corresponds to that of scientific publications and conference presentations. Participants are able to suggest extension to current methods.

Credits: 3 ECTS

Organizational issues

IMPORTANT: Register for the seminar mailing list by sending an email to Alexandros.Stamatakis@h-its.org

Please also register for the seminar via the campus system.

Up to date information on the seminar is provided at: [Seminar page](#).

We will start with a **kick-off meeting in the first week of the summer term** on April 24 from 10:00 - 11:30 in **SR 010**.

Seminar presentations will be conducted in a single block between 08:00 - 19:00 toward the end of the semester: July 27 in room **SR 010** - exact times to be determined

T**6.164 Module component: Seminar: Hot Topics in Explainable Artificial Intelligence (XAI) [T-INFO-112917]****Coordinators:** Prof. Dr. Christian Wressnegger**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-106392 - Seminar: Hot Topics in Explainable Artificial Intelligence \(XAI\)](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	4 CP	Graded	Each summer term	2

Courses					
ST 2026	24005	Seminar: Hot Topics in Explainable Artificial Intelligence (XAI)	2 SWS	Seminar / 	Wressnegger, Noppel

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A written paper (seminar paper) must be prepared and a presentation must be given.

Prerequisites

None.

Below you will find excerpts from courses related to this module component:

V**Seminar: Hot Topics in Explainable Artificial Intelligence (XAI)**24005, SS 2026, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)
On-Site****Content**

This seminar is concerned with explainable machine learning in computer security. Learning-based systems often are difficult to interpret, and their decisions are opaque to practitioners. This lack of transparency is a considerable problem in computer security, as black-box learning systems are hard to audit and protect from attacks.

The module introduces students to the emerging field of explainable machine learning and teaches them to work up results from recent research. To this end, the students will read up on a sub-field, prepare a seminar report, and present their work at the end of the term to their colleagues.

Topics cover different aspects of the explainability of machine learning methods for the application in computer security in particular.

Organizational issues

English Course

T

6.165 Module component: Seminar: Information Systems [T-INFO-115055]**Coordinators:** Prof. Dr.-Ing. Klemens Böhm**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-107686 - Seminar: Information Systems](#)**Type**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Each term**Expansion**
1 semesters**Version**
1

Courses					
ST 2026	2400131	Advances in Data Science	2 SWS	Seminar / 	Böhm, Matteucci, Friederich
Exams					
ST 2026	7500100	Seminar Information Systems			Böhm

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

Success is assessed by preparing a written seminar paper and presenting it as a graded assessment of a different kind in accordance with Section 4 (2) No. 3 SPO. The seminar grade corresponds to the written performance, but can be lowered or raised by up to two grade levels by the presentation performance. If the seminar paper is discontinued after the topic has been issued, the seminar is assessed with a grade of 5.0.

The coursework is passed if the written paper and the presentations have each been passed individually; regular attendance at the sessions and active participation in the content-related discussions are also required to pass.

Prerequisites

None.

Recommendations

Lectures of the Chair of Information Management Systems that match the topic of the seminar are strongly recommended.

T**6.166 Module component: Seminar: Interpretability and Causality in Machine Learning [T-INFO-114237]****Coordinators:** Jun.-Prof. Dr. Jan Stühmer**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-107217 - Seminar: Interpretability and Causality in Machine Learning](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	Graded	Each summer term	1

Courses					
ST 2026	2400181	Interpretability and Causality in Machine Learning	2 SWS	Seminar / 	Stühmer
Exams					
ST 2026	7500319	Seminar: Interpretability and Causality in Machine Learning			Stühmer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A written elaboration must be prepared and a presentation must be given. Students may redraw from the examination during the first two weeks after the topic has been communicated. The assessment can be repeated once.

Prerequisites

None.

Recommendations

Attendance of the lecture "Machine Learning - Fundamentals and Algorithms" is recommended.

T**6.167 Module component: Seminar: Learning Causality - a Challenge for Human and Artificial Intelligence [T-INFO-114102]****Coordinators:** Dr. Dominik Janzing**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-107033 - Seminar: Learning Causality - a Challenge for Human and Artificial Intelligence](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	Graded	Each summer term	2

Courses					
WT 25/26	2400245	Do LLMs understand cause and effect?	2 SWS	Seminar / 	Janzing
ST 2026	2400145	Do LLMs understand cause and effect?	2 SWS	Seminar / 	Janzing
Exams					
WT 25/26	7500291	Seminar: Learning Causality - a Challenge for Human and Artificial Intelligence	Janzing		

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A written paper must be prepared and a presentation given. Withdrawal is possible within two weeks of the topic being assigned

Prerequisites

None.

Recommendations

The seminar is aimed at students of computer science, but also other subjects if they have a good mathematical background and interest (e.g. mathematics, physics, psychology).

Basic concepts of probability theory are assumed

T

6.168 Module component: Seminar: Legal Studies Bachelor [T-INFO-115024]**Coordinators:** Professorenschaft des Fachbereichs Recht**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101218 - Seminar Module Law](#)**Type**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Each term**Version**
1

Courses					
WT 25/26	2400014	Current Issues in Patent Law	2 SWS	Seminar /	Melullis
WT 25/26	2400165	Seminar Commercial and Corporate Law in Information Technology	2 SWS	Seminar /	Nolte
WT 25/26	2400177	Human vs. Machine: (Un-)Biased Legal Decision-Making?	2 SWS	Seminar /	Holzhausen
WT 25/26	2400184	EU Digital Regulatory Framework	2 SWS	Seminar /	Zufall
WT 25/26	2400203	EU Fundamental Rights and EU Economic Law in Smart Cities	2 SWS	Seminar /	Kasper-Schöniger
WT 25/26	2424186	Seminar Patent Law	2 SWS	Seminar /	Dammler
WT 25/26	2424389	Seminar "IT security law"	2 SWS	Seminar /	Schallbruch
WT 25/26	2513214	Seminar Information security and Data protection (Bachelor)	2 SWS	Seminar /	Volkamer, Raabe, Schiefer, Werner
ST 2026	2400005	Governance, Risk & Compliance	2 SWS	Seminar /	Herzig, Siddiq
ST 2026	2400078	Intelligente Chatbots und Recht	2 SWS	Seminar /	Raabe
ST 2026	2400171	Regulating AI: from ethics to law	2 SWS	Seminar /	Gil Gasiola
ST 2026	2400177	Designing Data Governance of Digital Systems	2 SWS	Seminar /	Pathak
ST 2026	2400225	Rechtlicher Rahmen für Künstliche Intelligenz	2 SWS	Seminar /	Sattler
ST 2026	24820	Current Issues in Patent Law	2 SWS	Seminar /	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, Cancelled

Below you will find excerpts from courses related to this module component:

V

Human vs. Machine: (Un-)Biased Legal Decision-Making?2400177, WS 25/26, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)**
On-Site

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 (Seminarraum Nr. 313, bei uns am Institut)

2. Termin: 05.02.2025 9:00- 16:00 Uhr (Seminarraum Nr. 313, bei uns am Institut).



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 with 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).



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).



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,
- sustainability
- 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)!*

*Explanation After 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) .

**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 for the exam ONLY via CAS (Campus-Portal)!**

***Explanation:** after 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**6.169 Module component: Seminar: Neural Networks and Artificial Intelligence [T-INFO-104777]****Coordinators:** Prof. Dr. Jan Niehues**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-102412 - Seminar: Neural Networks and Artificial Intelligence](#)**Type**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Each winter term**Version**
1

Courses					
WT 25/26	2400078	Seminar: Neuronale Netze und künstliche Intelligenz	2 SWS	Seminar	Waibel, Retkowski
ST 2026	2400130	Neural Networks and Artificial Intelligence	2 SWS	Seminar	Waibel, Retkowski
Exams					
WT 25/26	7500224	Seminar: Neural Networks and Artificial Intelligence			Niehues
ST 2026	00017	Seminar Neural Networks and Artificial Intelligence			Niehues

Below you will find excerpts from courses related to this module component:

V**Seminar: Neuronale Netze und künstliche Intelligenz**2400078, WS 25/26, 2 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)****Content**

In many tasks that appear natural to us, the fastest computers are unable to match the performance of the human brain. Neural networks attempt to simulate the parallel and distributed architecture of the brain in order to master these skills with learning algorithms. In this context, focus is being put on neural network approaches to computer vision and speech recognition, robotics and other areas.

In this seminar students will acquaint themselves with literature from provided topics and will present their results as a talk supported by slides to the other participants of the seminar.

Recommendations:

- Finishing the module "Kognitive Systeme" prior to the seminar is recommended.
- Attending the lecture "Deep Learning und Neuronale Netze" prior to the seminar is of advantage

V**Neural Networks and Artificial Intelligence**2400130, SS 2026, 2 SWS, [Open in study portal](#)**Seminar (S)****Content**

Inhalt (EN):

In many tasks that appear natural to us, the fastest computers are unable to match the performance of the human brain. Neural networks attempt to simulate the parallel and distributed architecture of the brain in order to master these skills with learning algorithms. In this context, focus is being put on neural network approaches to computer vision and speech recognition, robotics and other areas.

In this seminar students will acquaint themselves with literature from provided topics and will present their results as a talk supported by slides to the other participants of the seminar.

Recommendations:

- Finishing the module "Kognitive Systeme" prior to the seminar is recommended.
- Attending the lecture "Deep Learning und Neuronale Netze" prior to the seminar is of advantage

T

6.170 Module component: Seminar: Practical Graph Algorithms [T-INFO-114297]**Coordinators:** Prof. Dr. Henning Meyerhenke**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-107264 - Seminar: Practical Graph Algorithms](#)

Type
Examination of another type

Credits
4 CP

Grading
graded

Term offered
Irregular

Version
1

Courses					
ST 2026	2400196	Practical Graph Algorithms	2 SWS	Seminar	Meyerhenke
Exams					
ST 2026	754600002	Seminar: Practical Graph Algorithms			Meyerhenke

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A written paper must be prepared and a presentation given. Withdrawal is possible within two weeks of the topic being assigned.

Prerequisites

None.

Recommendations

Knowledge of algorithms, in particular graph algorithms, is a clear advantage. Exemplary lectures are Algorithms I and Algorithms II.

T

6.171 Module component: Seminar: Privacy and Security [T-INFO-114236]

Coordinators: Prof. Dr. Thorsten Strufe
Organisation: KIT Department of Informatics
Part of: [M-INFO-107216 - Seminar: Privacy and Security](#)

Type
Examination of another type

Credits
4 CP

Grading
graded

Term offered
Each winter term

Version
1

Courses					
WT 25/26	2400118	Seminar Privacy and Security	2 SWS	Seminar	Strufe, Guerra Balboa
Exams					
WT 25/26	7500127	Seminar Privacy and Security			Strufe

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A written paper must be prepared and a presentation given; in addition, preliminary papers must be submitted and commented on in a peer review between fellow students. Withdrawal is possible within two weeks of the topic being assigned.

Prerequisites

None.

Recommendations

Fundamentals of IT security, computer networks and distributed systems are required

Below you will find excerpts from courses related to this module component:

V

Seminar Privacy and Security

2400118, WS 25/26, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

Content

This Seminar discusses current topics of the research field technical data security.

This involves, for example:

- anonymous communication
- network security
- anonymous online- services
- anonymous digital payment services
- rating of the anonymity of online services
- anonymous publications of data (differential privacy, k- anonymity)
- transparency-/awareness-improvement systems
- support for media understanding.

Organizational issues

Die Anmeldung geschieht über ILIAS. Die genauen Termine finden Sie im ILIAS-Kurs und auf der Webseite des Lehrstuhls.

T

6.172 Module component: Seminar: Proofs from THE BOOK [T-INFO-106604]

Coordinators: Prof. Dr. Peter Sanders
Organisation: KIT Department of Informatics
Part of: [M-INFO-103306 - Seminar: Proofs from THE BOOK](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	graded	Irregular	1

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

The student must present multiple proofs over the course of the semester and moderate the ensuing discussion about those proofs. No written documents are required. Students may redraw from their participation until the end of the second seminar date.

Prerequisites

None.

Recommendations

The German version “Das Buch der Beweise” is available online at the KIT library within the KIT network. The English version “Proofs from THE BOOK” is available as a physical copy at the KIT library. We recommend having a look inside either version before registering for this seminar.

T

6.173 Module component: Seminar: Recent Highlights in Algorithms [T-INFO-114201]

Coordinators: TT-Prof. Dr. Thomas Bläsius
Prof. Dr. Peter Sanders
Dr. rer. nat. Torsten Ueckerdt

Organisation: KIT Department of Informatics

Part of: [M-INFO-107172 - Seminar: Recent Highlights in Algorithms](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	4 CP	graded	Irregular	1

Assessment

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO), by preparing a written seminar paper and the presentation of the same

Prerequisites

None.

Recommendations

Knowledge of the basics of graph theory and algorithm technology is helpful.

T**6.174 Module component: Seminar: Research Trends in Human-Computer Interaction [T-INFO-113284]****Coordinators:** Prof. Dr. Kathrin Gerling**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-106594 - Seminar: Research Trends in Human-Computer Interaction](#)**Type**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Each winter term**Version**
2

Courses					
WT 25/26	2400199	Research Trends in Human-Computer Interaction (Seminar)	2 SWS	Seminar / 	Gerling
ST 2026	2400080	Research Trends in Human-Computer Interaction (Seminar)	2 SWS	Seminar / 	Gerling
Exams					
WT 25/26	7500058	Research Trends in Human-Computer Interaction (Seminar)			Gerling
ST 2026	7500036	Research Trends in Human-Computer Interaction (Seminar)			Gerling

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T**6.175 Module component: Seminar: Robot Reinforcement Learning [T-INFO-110862]****Coordinators:** Prof. Dr. Gerhard Neumann**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-105379 - Seminar: Robot Reinforcement Learning](#)

Type
Examination of another type

Credits
3 CP

Grading
graded

Term offered
Irregular

Version
1

Courses					
ST 2026	2400084	Seminar: Robot Reinforcement Learning	2 SWS	Seminar / 	Neumann

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.176 Module component: Seminar: Secure Multiparty Computation [T-INFO-111501]**Coordinators:** Prof. Dr. Jörn Müller-Quade**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-105761 - Seminar: Secure Multiparty Computation](#)**Type**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Irregular**Version**
1

Courses					
WT 25/26	2400088	Seminar Secure Multiparty Computation	2 SWS	Seminar / 	Raiber, Jiang, Müller-Quade
Exams					
WT 25/26	7500326	Seminar: Secure Multiparty Computation			Müller-Quade

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

A written paper must be prepared and/or a presentation must be given. Withdrawal is possible within two weeks of the topic being assigned.

Prerequisites

None.

Recommendations

Knowledge of the content of the lecture Cryptographic Protocols is assumed.

T

6.177 Module component: Seminar: Service-Oriented Architectures [T-INFO-104740]**Coordinators:** Prof. Dr. Sebastian Abeck**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-102372 - Seminar: Service-Oriented Architectures](#)

Type Examination of another type
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Credits 3 CP

Grading graded

Term offered Each term

Version 1

Courses					
WT 25/26	2400072	Seminar: Service-oriented Architectures	2 SWS	Seminar / 	Abeck, Schneider
ST 2026	2400072	Seminar: Service-oriented Architectures	2 SWS	Seminar / 	Abeck, Schneider
Exams					
WT 25/26	75104740	Seminar: Service-Oriented Architectures			Abeck
ST 2026	75104740	Seminar: Service-Oriented Architectures			Abeck

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.178 Module component: Seminar: Software Architecture, Security and Privacy [T-INFO-114260]**Coordinators:** Prof. Dr. Ralf Reussner**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-107236 - Seminar: Software Architecture, Security and Privacy](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	4 CP	graded	Irregular	1

Courses					
WT 25/26	2400060	Data in Software-Intensive Technical Systems – Modeling – Analysis – Protection	2 SWS	Seminar / 	Reussner, Raabe, Werner, Müller-Quade
Exams					
WT 25/26	7500232	Seminar Data in Software-Intensive Technical Systems – Modeling – Analysis – Protection			Reussner

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

- the preparation of a written paper (50%)
- the assessment of two seminar papers as part of a peer review (10%)
- the preparation of presentation slides and giving a presentation (20%)
- punctuality of submissions (20%)

Prerequisites

None.

T**6.179 Module component: Seminar: Software Quality Assurance and Software Test [T-INFO-111850]****Coordinators:** Prof. Dr.-Ing. Ina Schaefer**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-105895 - Seminar: Software Quality Assurance and Software Test](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	4 CP	graded	Each summer term	2

T

6.180 Module component: Seminar: Speech-to-Speech Translation [T-INFO-114208]**Coordinators:** Prof. Dr. Jan Niehues**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-107179 - Seminar: Speech-to-Speech Translation](#)

Type	Credits	Grading	Term offered	Version
Examination of another type	3 CP	Graded	Each summer term	1

Courses					
ST 2026	2400032	Seminar Speech-to-Speech Translation	2 SWS	Seminar / 	Niehues

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Assessment**

The assessment is carried out as an examination of another type (§ 4 Abs. 2 No. 3 SPO).

Prerequisites

None.

Below you will find excerpts from courses related to this module component:

V

Seminar Speech-to-Speech Translation2400032, SS 2026, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)**
On-Site**Content**

In a globalized world, language barriers are a major obstacle for communication. Speech-to-Speech translation (S2ST) technology is a promising solution to overcome this barrier. S2ST models convert source speech into speech in another language. Within S2ST, knowledge from automatic speech recognition and machine translation models are combined. Starting from solutions that simply combine individual systems, recently many interesting research directions have been explored (e.g., end-to-end models, simultaneous speech translation, speech synthesis, etc.).

In this seminar, students will delve into a chosen topic from the area of S2ST, based on the provided initial literature. At the end of the semester, the students will present their findings in oral presentations and written reports. The topics and the corresponding supervisors will be presented during the kickoff meeting.

Only the kickoff meeting and final presentations are attended by all participants together. During the semester, the communication will be with the topic supervisors individually.

Please do not join this seminar and our other seminar "Advanced Topics in Natural Language Processing" in parallel.

T**6.181 Module component: Seminar: Ubiquitous Systems [T-INFO-103578]****Coordinators:** Prof. Dr.-Ing. Michael Beigl**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101880 - Seminar: Ubiquitous Systems](#)

Type
Examination of another type

Credits
4 CP

Grading
graded

Term offered
Each term

Version
1

Courses					
WT 25/26	2424844	Seminar: Ubiquitous Systems	2 SWS	Seminar	Beigl, Röddiger
ST 2026	24844	Seminar: Ubiquitous Systems	2 SWS	Seminar / 	Beigl
Exams					
WT 25/26	7500005	Seminar: Ubiquitous Systems	Beigl		

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.182 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 - LaunchLab2545022, 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**6.183 Module component: Software Engineering I [T-INFO-101968]**

Coordinators: Prof. Dr.-Ing. Ina Schaefer
Organisation: KIT Department of Informatics
Part of: [M-INFO-101175 - Software Engineering I](#)

Type
Written examination

Credits
6 CP

Grading
graded

Term offered
Each summer term

Version
1

Courses					
ST 2026	24518	Softwaretechnik I	4 SWS	Lecture / Practice / 	Schaefer, Eichhorn
Exams					
WT 25/26	7500123	Software Engineering I			Schaefer
ST 2026	7500152	Software Engineering I			Schaefer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T**6.184 Module component: Software Engineering I Pass [T-INFO-101995]****Coordinators:** Prof. Dr.-Ing. Ina Schaefer**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101175 - Software Engineering I](#)**Type**
Coursework**Credits**
0 CP**Grading**
pass/fail**Term offered**
Each summer term**Version**
1

Courses					
ST 2026	24518	Softwaretechnik I	4 SWS	Lecture / Practice / 	Schaefer, Eichhorn
Exams					
ST 2026	7500250	Software Engineering I Pass			Schaefer

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.185 Module component: Software Engineering II [T-INFO-114259]

Coordinators: Prof. Dr.-Ing. Anne Koziolk
 Prof. Dr. Raffaella Mirandola
 Prof. Dr. Ralf Reussner

Organisation: KIT Department of Informatics

Part of: [M-INFO-107235 - Software Engineering II](#)

Type
Written examination

Credits
6 CP

Grading
graded

Term offered
Each summer term

Version
1

Courses					
ST 2026	24076	Software Engineering II	4 SWS	Lecture / 	Reussner, Mirandola, Dehghani
Exams					
WT 25/26	7500054	Software Engineering II			Reussner
ST 2026	7500207	Software Engineering II			Reussner

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is carried out as a written examination (§ 4 Abs. 2 No. 1 SPO) lasting 90 minutes.

Prerequisites

None.

Recommendations

The course *Software Engineering I* should already have been attended.

T

6.186 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**6.187 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
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

6.188 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-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
ST 2026	2600009	Tutorien zu Statistik I	2 SWS	Tutorial	Grothe, Becker
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

6.189 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	Grading 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 is 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

6.190 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**
Written examination**Credits**
4,5 CP**Grading**
graded**Term offered**
Each summer term**Version**
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

6.191 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**
Examination of another type**Credits**
4,5 CP**Grading**
graded**Term offered**
Each winter term**Version**
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

Student2Startup2500165, 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.

**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**6.192 Module component: Supplement Applied Informatics [T-WIWI-110711]****Coordinators:** Professorenschaft des Instituts AIFB**Organisation:** KIT Department of Business and Economics**Part of:** [M-WIWI-101476 - Business Processes and Information Systems](#)

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

6.193 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,  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

6.194 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
Written examination

Credits
4,5 CP

Grading
graded

Term offered
Each summer term

Version
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 successful 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

T

6.195 Module component: Team Project Software Development [T-INFO-109823]

Coordinators: Prof. Dr. Sebastian Abeck
Prof. Dr. Ralf Reussner

Organisation: KIT Department of Informatics

Part of: M-INFO-104809 - Team Project Software Development

Type
Examination of another type

Credits
8 CP

Grading
graded

Term offered
Each term

Version
2

Courses					
WT 25/26	2400101	Team Project Software Development	2 SWS	Practical course / 	Abeck, Reussner, Burger, Oberweis, Mädche, Scheibehenne, Zöllner
ST 2026	2424901	Team Project Software Development	2 SWS	Practical course / 	Abeck, Reussner
Exams					
WT 25/26	7500150	Team Project Software Development: Write Your Own Android App			Koziolek
WT 25/26	7500340	Team Project Software Development: Application CredentialManager			Abeck
WT 25/26	7900144	Team Project Software Development: Solid Access Control Server			Käfer
WT 25/26	7900148	Team Project Software Development: (I)nsights – Improving Customer Experience through a Virtual Reality Analytics Dashboard			Pfeiffer
WT 25/26	7900149	Team Project Software Development: Exploring xAI – Designing an Interactive Web Interface for Understanding AI Decisions in Moral Dilemmas			Pfeiffer
WT 25/26	7900174	Team Project Software Development: Developing a graph-based digital library for the Information Systems community			Mädche
WT 25/26	7900180	Team Project Software Development: LLM-controlled avatars for conducting interviews in extended reality			Mädche
WT 25/26	7900219	Team Project Software Development: Development of an adaptive avatar-twin system for digital consultations			Mädche
WT 25/26	7900243	Team Project Software Development: Supporting ADHD Anamnesis through Intelligent Pre-Analysis of Written Patient Records			Mädche
WT 25/26	7900260	Team Project Software Development: Development of a Copilot System to Support the Adoption of Generative AI in Organizations			Weinhardt
WT 25/26	7900262	Team Project Software Development			Oberweis
WT 25/26	7900290	Team Project Software Development – Collaborative Perception and Platooning under Red-Light Violations in CARLA			Zöllner

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.196 Module component: Telematics [T-INFO-114269]

Coordinators: Prof. Dr. Martina Zitterbart
Organisation: KIT Department of Informatics
Part of: [M-INFO-107243 - Telematics](#)

Type
Written examination

Credits
6 CP

Grading
graded

Term offered
Each winter term

Version
1

Courses					
WT 25/26	2400007	Telematics	4 SWS	Lecture / 	Zitterbart, Helmig, Mahrt, Seehofer
Exams					
WT 25/26	7500166	Telematics			Zitterbart
ST 2026	7500098	Telematics			Zitterbart

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

The assessment is carried out as a written examination (§ 4 Abs. 2 No. 1 SPO) lasting 90 minutes.

Depending on the number of participants, it will be announced six weeks before the examination (Section 6 (3) SPO) whether the assessment will take place

- in the form of an oral examination of approx. 30 minutes in accordance with § 4 Para. 2 No. 2 SPO
- or in the form of a written examination in accordance with § 4 Para. 2 No. 1 SPO

Prerequisites

None.

Recommendations

- Contents of the lecture *Introduction to computer networks* or comparable lectures are a prerequisite.
- Attendance of the module-accompanying *basic practical course Protocol Engineering* is recommended.

Below you will find excerpts from courses related to this module component:

V

Telematics

2400007, WS 25/26, 4 SWS, Language: English, [Open in study portal](#)

Lecture (V)
On-Site

Content

The lecture covers (i.a.) protocols, architectures, as well as methods and algorithms, for routing and establishing reliable end-to-end connections in the Internet. In addition to various methods for media access control in local area networks, the lecture also covers other communication systems, e.g. circuit-switched systems such as ISDN. Participants should also have understood the possibilities for managing and administering networks.

Familiarity with the contents of the lecture *Einführung in Rechnernetze* or comparable lectures is assumed.

Learning Objectives

After attending this lecture, the students will

- have a profound understanding of protocols, architectures, as well as procedures and algorithms used for routing and for establishing reliable end-to-end connections in the Internet
- have a profound understanding of different media access control procedures in local networks and other communication systems like circuit-switched ISDN
- have a profound understanding of the problems that arise in large scale dynamic communication systems and are familiar with mechanism to deal with these problems
- be familiar with current developments such as SDN and data center networking
- be familiar with different aspects and possibilities for network management and administration

Students have a profound understanding of the basic protocol mechanisms that are necessary to establish reliable end-to-end communication. Students have detailed knowledge about the congestion and flow control mechanisms used in TCP and can discuss fairness issue in the context of multiple parallel transport streams. Students can analytically determine the performance of transport protocols and know techniques for dealing with specific constraints in the context of TCP, e.g., high data rates and low latencies. Students are familiar with current topics such as the problem of middle boxes on the Internet, the usage of TCP in data centers or multipath TCP. Students are also familiar with practical aspects of modern transport protocols and know practical ways to overcome heterogeneity in the development of distributed applications.

Students know the functions of (Internet) routing and routers and can explain and apply common routing algorithms. Students are familiar with routing architectures and different alternatives for buffer placement as well as their advantages and disadvantages. Students understand the classification into interior and exterior gateway protocols and have in-depth knowledge of the functionality and features of common protocols such as RIP, OSPF, and BGP. Students are also familiar with current topics such as label switching, IPv6 and SDN.

Students know the function of media access control and are able to classify and analytically evaluate different media access control mechanisms. Students have an in-depth knowledge of Ethernet and various Ethernet variants and characteristics, which especially includes current developments such as real-time Ethernet and data center Ethernet. Students can explain and apply the Spanning Tree Protocol.

Students know the architecture of ISDN and can reproduce the peculiarities of setting up the ISDN subscriber line. Students are familiar with the technical features of DSL.

Literature

S. Keshav. An Engineering Approach to Computer Networking. Addison-Wesley, 1997 J.F. Kurose, K.W. Ross. Computer Networking: A Top-Down Approach Featuring the Internet. 4rd Edition, Addison-Wesley, 2007 W. Stallings. Data and Computer Communications. 8th Edition, Prentice Hall, 2006 Weiterführende Literatur •D. Bertsekas, R. Gallager. Data Networks. 2nd Edition, Prentice-Hall, 1991 •F. Halsall. Data Communications, Computer Networks and Open Systems. 4th Edition, Addison-Wesley Publishing Company, 1996 •W. Haaß. Handbuch der Kommunikationsnetze. Springer, 1997 •A.S. Tanenbaum. Computer-Networks. 4th Edition, Prentice-Hall, 2004 •Internet-Standards •Artikel in Fachzeitschriften

T**6.197 Module component: Theoretical Foundations of Computer Science [T-INFO-103235]**

Coordinators: Prof. Dr.-Ing. Marvin Künnemann
Dr. rer. nat. Torsten Ueckerdt

Organisation: KIT Department of Informatics

Part of: [M-INFO-101189 - Theoretical Informatics](#)

Type
Written examination

Credits
6 CP

Grading
graded

Term offered
Each winter term

Version
1

Courses					
WT 25/26	2424005	Theoretical Foundations of Computer Science		Lecture / Practice / 	Müller-Quade, Benz, Hetzel
Exams					
WT 25/26	7500251	Theoretical Foundations of Computer Science			Müller-Quade

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Assessment

Success is assessed in the form of a written examination (usually 120 minutes) in accordance with Section 4 (2) No. 1 SPO.

A grade bonus can be earned by successfully completing exercises. 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. This bonus is only valid for one examination in the same semester. After that, the grade bonus expires.

Prerequisites

None.

T

6.198 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**
Examination of another type**Credits**
3 CP**Grading**
graded**Term offered**
Each term**Version**
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 Management2573015, 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.

**Topics in Human Resource Management**

2573015, SS 2026, 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

Geb. 05.20, Raum 2A-25, Termine werden bekannt gegeben

T**6.199 Module component: Visual Computing [T-INFO-115050]****Coordinators:** Prof. Dr.-Ing. Carsten Dachsbacher**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-107682 - Visual Computing](#)**Type**
Written examination**Credits**
3 CP**Grading**
graded**Term offered**
Each summer term**Version**
1

Courses					
ST 2026	2400092	Visual Computing	2 SWS	Lecture / 	Dachsbacher

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T**6.200 Module component: Web Applications and Service-Oriented Architectures (I) [T-INFO-103122]****Coordinators:** Prof. Dr. Sebastian Abeck**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101636 - Web Applications and Service-Oriented Architectures \(I\)](#)

Type	Credits	Grading	Term offered	Version
Oral examination	4 CP	graded	Each winter term	1

Courses					
WT 25/26	2424153	Web Applications and Service-oriented Architectures (I)	2 SWS	Lecture / 	Abeck, Schneider, Throner
Exams					
WT 25/26	7500026	Web Applications and Service-oriented Architectures (I)			Abeck

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

6.201 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
Written examination

Credits
4,5 CP

Grading
graded

Term offered
see Annotations

Version
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.