Karlsruher Institut für Technologie

Module Handbook
Information Systems B.Sc.

SPO 2019

Summer term 2025

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KIT DEPARTMENT OF ECONOMICS AND MANAGEMENT / KIT DEPARTMENT OF INFORMATICS

Table Of Contents

1 General Information

1.1 Study program details

KIT-Department	KIT Department of Economics and Management / KIT Department of Informatics
Academic Degree	Bachelor of Science (B.Sc.)
Examination Regulations Version	2019
Regular terms	6 terms
Maximum terms	9 terms
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

1.2 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 Economics and Management 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.

1.3 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.

1.4 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.

1.5 Acceptance Criterias

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

1.6 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

1.7 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 Economics and Management 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
   .

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 Economics and Management and the FAQs of the KIT Department of Informatics.

2 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.

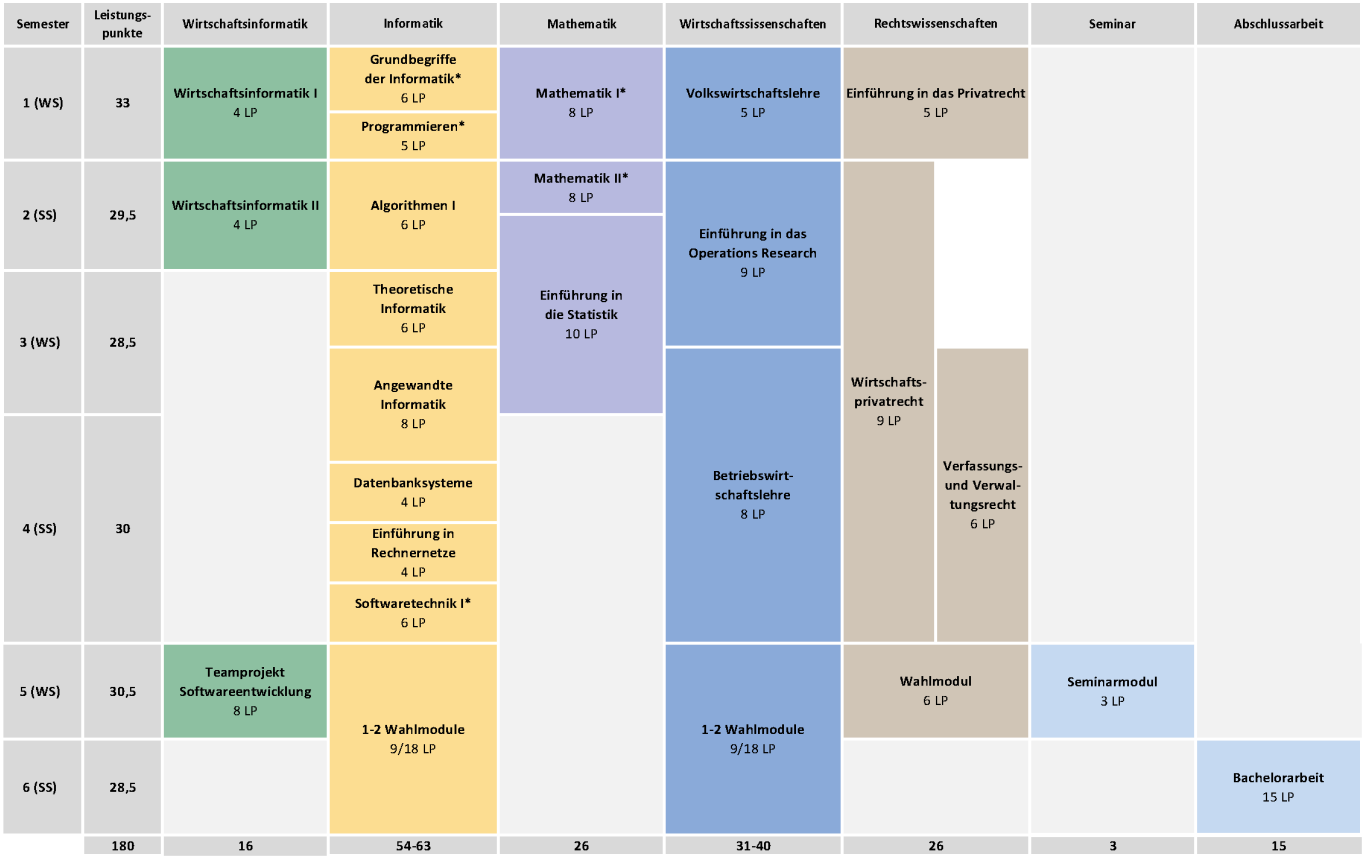

Figure 2: Recommended structure and subject structure of the bachelor's programme in Information Systems (german)

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.

3 Field of study structure

Mandatory	
Bachelor's Thesis	15 CR
Orientation Exam *This field will not influence the calculated grade of its parent.*	
Information Systems	16 CR
Informatics	54-63 CR
Mathematics	26 CR
Economics and Management	31-40 CR
Law	26 CR
Seminars	3 CR

3.1 Bachelor's Thesis

Credits
15

Mandatory		
M-INFO-104875	Module Bachelor's Thesis	15 CR

3.2 Orientation Exam

Mandatory		
M-WIWI-104843	Orientation Exam	0 CR

3.3 Information Systems

Credits
16

Mandatory		
M-INFO-104809	Team Project Software Development	8 CR
M-WIWI-104820	Information Systems I	4 CR
M-WIWI-104821	Information Systems II	4 CR

3.4 Informatics

Credits
54-63

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	6 CR
M-WIWI-101430	Applied Informatics	8 CR
M-INFO-104921	Database Systems	4 CR
M-INFO-103455	Introduction in Computer Networks	4 CR
M-INFO-101170	Basic Notions of Computer Science	6 CR
M-INFO-101174	Programming	5 CR
M-INFO-101175	Software Engineering I	6 CR
M-INFO-101189	Theoretical Informatics	6 CR
Compulsory Elective Modules in Informatics (Election: between 9 and 18 credits)		
M-INFO-101220	Algorithms for Planar Graphs	5 CR
M-INFO-101865	Lab: Working with Database Systems	4 CR
M-INFO-101184	Mobile Robots – Practical Course	4 CR
M-INFO-101247	Lab Protocol Engineering	4 CR
M-INFO-101219	Practical Course Computer Engineering: Hardware Design	4 CR
M-INFO-101633	Practical Course Web Applications and Service-Oriented Architectures (I)	5 CR
M-INFO-101230	Basic Practical Course for the ICPC-Programming Contest	4 CR
M-INFO-106311	Practical Course: Managing Scientific Data	4 CR
M-INFO-101177	Operating Systems	6 CR
M-INFO-100856	Computer Graphics	6 CR
M-INFO-106291	Digital Games	6 CR
M-INFO-102978	Digital Circuits Design	6 CR
M-INFO-101254	Surfaces for Computer Aided Design	5 CR
M-INFO-100799	Formal Systems	6 CR
M-WIWI-101476	Business Processes and Information Systems	9 CR
M-INFO-106014	Introduction to Artificial Intelligence	5 CR
M-INFO-105589	Introduction to Data and Information Management	8 CR
M-INFO-107166	Human Computer Interaction neu	6 CR
M-INFO-106327	Informatics Seminar	3 CR
M-INFO-106015	Information Security	5 CR
M-WIWI-104069	Information Security	9 CR
M-INFO-101248	Curves in CAD	5 CR
M-INFO-102557	Lego Mindstorms - Practical Course	4 CR
M-INFO-101245	MARS-Based Internship	4 CR
M-INFO-100757	Mechano-Informatics and Robotics	4 CR
M-INFO-101183	Microprocessors I	3 CR
M-INFO-101249	Mobile Computing and Internet of Things	5 CR
M-INFO-106800	Practical Course: AI for Climate and Weather Predictions neu	6 CR
M-INFO-103179	Computer Organization	6 CR
M-INFO-100818	Computer Architecture	6 CR
M-INFO-107162	Robotics I - Introduction to Robotics neu	6 CR
M-WIWI-101438	Semantic Knowledge Management	9 CR
M-INFO-101636	Web Applications and Service-Oriented Architectures (I)	4 CR
M-INFO-105735	Geometric Basics for Geometry Processing neu	3 CR
M-INFO-107235	Software Engineering II neu	6 CR
M-INFO-107201	Algorithms II neu	6 CR
M-INFO-107243	Telematics neu	6 CR

3.5 Mathematics

Credits
26

Mandatory		
M-WIWI-101432	Introduction to Statistics	10 CR
M-MATH-104914	Mathematics I	8 CR
M-MATH-104915	Mathematics II	8 CR

3.6 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	8 CR
M-WIWI-101418	Introduction to Operations Research	9 CR
M-WIWI-101431	Economics	5 CR
Business Administration (Election:)		
M-WIWI-101434	eBusiness and Service Management	9 CR
M-WIWI-101402	eFinance	9 CR
M-WIWI-101464	Energy Economics	9 CR
M-WIWI-101435	Essentials of Finance	9 CR
M-WIWI-103120	Financial Economics	9 CR
M-WIWI-105610	Financial Data Science	9 CR
M-WIWI-102752	Fundamentals of Digital Service Systems	9 CR
M-WIWI-101424	Foundations of Marketing	9 CR
M-WIWI-105928	HR Management & Digital Workplace	9 CR
M-WIWI-101437	Industrial Production I	9 CR
M-WIWI-105981	Information Systems & Digital Business	9 CR
M-WIWI-106860	Leadership & Sustainable HR-Management	9 CR
M-WIWI-105482	Machine Learning and Data Science	9 CR
M-WIWI-105414	Statistics and Econometrics II	9 CR
M-WIWI-101425	Strategy and Organization	9 CR
M-WIWI-101421	Supply Chain Management	9 CR
M-WIWI-101465	Topics in Finance I	9 CR
M-WIWI-101423	Topics in Finance II	9 CR
Operations Research (Election:)		
M-WIWI-101413	Applications of Operations Research	9 CR
M-WIWI-101936	Methodical Foundations of OR	9 CR
M-WIWI-103278	Optimization under Uncertainty	9 CR
Statistics (Election:)		
M-WIWI-101599	Statistics and Econometrics	9 CR
Economics (Election:)		
M-WIWI-106472	Advanced Macroeconomics	9 CR
M-WIWI-101499	Applied Microeconomics	9 CR
M-WIWI-101403	Public Finance	9 CR
M-WIWI-101599	Statistics and Econometrics	9 CR
M-WIWI-101668	Economic Policy I	9 CR
M-WIWI-101501	Economic Theory	9 CR

3.7 Law

Credits
26

Mandatory		
M-INFO-101190	Introduction to Civil Law	5 CR
M-INFO-101191	Commercial Law	9 CR
M-INFO-105247	Constitutional and Administrative Law	6 CR
Compulsory Elective Module in Law (Election: at least 6 credits)		
M-INFO-101253	Intellectual Property and Data Protection	6 CR

3.8 Seminars

Credits
3

Compulsory Elective Seminar in Informatics (Election: at most 3 credits)		
M-INFO-102058	Seminar Module Informatics	3 CR
M-INFO-101218	Seminar Module Law	3 CR
M-WIWI-101826	Seminar Module Economic Sciences	3 CR

4 Modules

M 4.1 Module: Advanced Macroeconomics [M-WIWI-106472]

Responsible: Prof. Dr. Johannes Brumm
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Economics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	English	3	2

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

Competence Certificate
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.

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

Responsible: Dr. rer. nat. Torsten Ueckerdt
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each summer term	1 term	German	3	1

Mandatory			
T-INFO-101986	Algorithms for Planar Graphs	5 CR	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.

Annotation
The module is offered irregularly.

Workload
approx. 150 h

M 4.3 Module: Algorithms I [M-INFO-100030]

Responsible: TT-Prof. Dr. Thomas Bläsius
Organisation: KIT Department of Informatics
Part of: Informatics (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	1	1

Mandatory			
T-INFO-100001	Algorithms I	6 CR	Bläsius

M 4.4 Module: Algorithms II [M-INFO-107201]

Responsible: Prof. Dr. Peter Sanders
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	English	4	1

Mandatory			
T-INFO-114225	Algorithms II	6 CR	Sanders

Competence Certificate
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 4.5 Module: Applications of Operations Research [M-WIWI-101413]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Operations Research)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	9

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

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

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

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

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

Competence Goal
The student

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

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

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

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

Annotation
The planned lectures and courses for the next three years are announced online.

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

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

M 4.6 Module: Applied Informatics [M-WIWI-101430]

Responsible: Prof. Dr. Andreas Oberweis
Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Economics and Management
Part of: Informatics (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	Grade to a tenth	Each term	2 terms	German	2	3

Mandatory			
T-WIWI-110339	Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services	4 CR	Sunyaev
T-WIWI-110338	Applied Informatics – Modelling	4 CR	Oberweis

Competence Certificate
Please note: The examination "Applied Computer Science – Internet Computing" will be offered for the last time in the summer semester 2025 for first-time students. The last examination opportunity (only for repeaters) will be in the winter semester 2025/2026. The lecture "Applied Computer Science - Internet Computing" (Prof. Dr. A. Sunyaev) will be replaced by the new lecture "Applied Computer Science - Cybersecurity" (Prof. Dr. M. Volkamer).

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 should:

- Becomes familiar with relevant modelling languages for describing application domains and aspects of early software system design.
- Gains insight into methods and systems of computer science for the design and development of distributed information systems (supporting electronic business),
- is able to select, design, and apply these methods and systems in a way that is appropriate for the application context.

Content
The course Applied Informatics - Modelling [2511030] mainly adresses 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 - Internet Computing [2511032] provides insights into fundamental concepts and future technologies of distributed systems and Internet computing. Students should be able to select, design and apply the presented concepts and technologies. The course first introduces basic concepts of distributed systems (e.g. design of architectures for distributed systems, internet architectures, web services, middleware).

In the second part of the course, emerging technologies of Internet computing will be examined in depth. These include, among others:

- Cloud Computing
- Edge & Fog Computing
- Internet of Things
- Blockchain
- Artificial Intelligence

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.

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

M 4.7 Module: Applied Microeconomics [M-WIWI-101499]

Responsible: Prof. Dr. Johannes Philipp Reiß
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Economics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	4

Compulsory Elective Courses (Election: at least 9 credits)			
T-WIWI-102876	Auction & Mechanism Design	4,5 CR	Szech
T-WIWI-112228	Digital Markets and Market Design	4,5 CR	Hillenbrand
T-WIWI-102892	Economics and Behavior	4,5 CR	Szech
T-WIWI-102850	Introduction to Game Theory	4,5 CR	Puppe, Reiß
T-WIWI-102844	Industrial Organization	4,5 CR	Reiß
T-WIWI-102739	Public Revenues	4,5 CR	Wigger
T-WIWI-102736	Economics III: Introduction in Econometrics	5 CR	Schienle
T-WIWI-100005	Competition in Networks	4,5 CR	Mitusch

Competence Certificate
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.

Recommendation
Completion of the module Economics is strongly recommended.

M 4.8 Module: Basic Notions of Computer Science [M-INFO-101170]

Responsible: Dr. rer. nat. Mattias Ulbrich
Organisation: KIT Department of Informatics
Part of: Informatics (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	1	1

Mandatory			
T-INFO-101965	Basic Notions of Computer Science Pass	0 CR	Ueckerdt, Ulbrich
T-INFO-101964	Basic Notions of Computer Science	6 CR	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 4.9 Module: Basic Practical Course for the ICPC-Programming Contest [M-INFO-101230]

Responsible: TT-Prof. Dr. Thomas Bläsius
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	pass/fail	Each summer term	1 term	German	3	1

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

M 4.10 Module: Business Administration [M-WIWI-105267]

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

Organisation: KIT Department of Economics and Management

Part of: Economics and Management (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	Grade to a tenth	Each term	2 terms	German	2	3

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

Competence Certificate
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 asses 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 4.11 Module: Business Processes and Information Systems [M-WIWI-101476]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	6

Compulsory Elective Courses (Election: between 1 and 2 items)			
T-WIWI-102697	Business Process Modelling	4,5 CR	Oberweis
T-WIWI-109799	Process Mining	4,5 CR	Oberweis
Supplementary Courses (Election: between 0 and 1 items)			
T-WIWI-110711	Supplement Applied Informatics	4,5 CR	Professorenschaft des Instituts AIFB
T-WIWI-104679	Foundations of Mobile Business	4,5 CR	Oberweis
T-WIWI-110541	Advanced Lab Informatics (Bachelor)	4,5 CR	Professorenschaft des Instituts AIFB
T-WIWI-112915	Advanced Lab Realization of Innovative Services (Bachelor)	4,5 CR	Oberweis

Competence Certificate
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 4.12 Module: Commercial Law [M-INFO-101191]

Responsible: N.N.
Organisation: KIT Department of Informatics
Part of: Law (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	3 terms	German	1	3

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

M 4.13 Module: Computer Architecture [M-INFO-100818]

Responsible: Prof. Dr. Wolfgang Karl
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	3	1

Mandatory			
T-INFO-101355	Computer Architecture	6 CR	Karl

M 4.14 Module: Computer Graphics [M-INFO-100856]

Responsible: Prof. Dr.-Ing. Carsten Dachsbacher
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	3	1

Mandatory			
T-INFO-101393	Computer Graphics	6 CR	Dachsbacher
T-INFO-104313	Computer Graphics Pass	0 CR	Dachsbacher

M 4.15 Module: Computer Organization [M-INFO-103179]

Responsible: Prof. Dr. Wolfgang Karl
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	3	1

Mandatory			
T-INFO-103531	Computer Organization	6 CR	Karl

M 4.16 Module: Constitutional and Administrative Law [M-INFO-105247]

Responsible: TT-Prof. Dr. Frederike Zufall
Organisation: KIT Department of Informatics
Part of: Law (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each term	2 terms	German	2	1

Mandatory			
T-INFO-110300	Public Law I & II	6 CR	N.N.

Workload
See German version.

M 4.17 Module: Curves in CAD [M-INFO-101248]

Responsible: Prof. Dr. Hartmut Prautzsch
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Irregular	1 term	German	3	1

Mandatory			
T-INFO-102067	Curves in CAD	5 CR	Prautzsch

Competence Goal
Basic knowledge about smooth freeform curves, and about their representations in CAD systems and in computer graphics. In particular, knowledge of control points and the geometric properties of Bézier and B-spline representations.

Content
Bézier and B-spline-Technics, polarforms, algorithms of de Casteljau, de Boor and Boehm, Oslo-Algorithm, Stärk's C^k construction, subdivision, change of representations, intersection algorithms,, interpolation with splines, and a bit on tensorproduct surfaces (= curves controlled by curves).

M 4.18 Module: Database Systems [M-INFO-104921]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: Informatics (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each summer term	1 term	German	2	1

Mandatory			
T-INFO-101497	Database Systems	4 CR	Böhm

M 4.19 Module: Digital Circuits Design [M-INFO-102978]

Responsible: Prof. Dr.-Ing. Uwe Hanebeck
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	3	1

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

M 4.20 Module: Digital Games [M-INFO-106291]

Responsible: Prof. Dr. Kathrin Gerling
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	3	1

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

M 4.21 Module: eBusiness and Service Management [M-WIWI-101434]

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

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	12

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

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

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

Prerequisites
None

Competence Goal
The students

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

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

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

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

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

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

Annotation
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 4.22 Module: Economic Policy I [M-WIWI-101668]

Responsible: Prof. Dr. Ingrid Ott
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Economics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	10

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

Competence Certificate
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.

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

M 4.23 Module: Economic Theory [M-WIWI-101501]

Responsible: Prof. Dr. Clemens Puppe
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Economics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German/English	3	3

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-102609	Advanced Topics in Economic Theory	4,5 CR	Brumm, Mitusch
T-WIWI-102876	Auction & Mechanism Design	4,5 CR	Szech
T-WIWI-102892	Economics and Behavior	4,5 CR	Szech
T-WIWI-102850	Introduction to Game Theory	4,5 CR	Puppe, Reiß
T-WIWI-102844	Industrial Organization	4,5 CR	Reiß
T-WIWI-109121	Macroeconomic Theory	4,5 CR	Brumm
T-WIWI-102610	Welfare Economics	4,5 CR	Puppe

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

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

Prerequisites
None

Competence Goal
Students

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

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

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

Annotation
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.

Recommendation
None

M 4.24 Module: Economics [M-WIWI-101431]

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

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each term	1 term	German	1	2

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

Competence Certificate
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.

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

Workload
See German version.

M 4.25 Module: eFinance [M-WIWI-101402]

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

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German/English	3	9

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

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

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

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

Competence Goal
The students

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

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

Annotation
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 4.26 Module: Energy Economics [M-WIWI-101464]

Responsible: Prof. Dr. Wolf Fichtner
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	4

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

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

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

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

Competence Goal
The student

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

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

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

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

Annotation
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.

Recommendation
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 4.27 Module: Essentials of Finance [M-WIWI-101435]

Responsible: Prof. Dr. Martin Ruckes
Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each summer term	1 term	German	3	3

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

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

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

Prerequisites
None

Competence Goal
The student

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

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

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

M 4.28 Module: Financial Data Science [M-WIWI-105610]

Responsible: Prof. Dr. Maxim Ulrich
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each summer term	1 term	English	3	2

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

Competence Certificate
The module examination is structured as an alternative assessment.

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 4.29 Module: Financial Economics [M-WIWI-103120]

Responsible: Prof. Dr. Maxim Ulrich
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each winter term	1 term	English	3	2

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-102878	Computational Risk and Asset Management	4,5 CR	Ulrich
T-WIWI-106194	Macro-Finance	4,5 CR	Ulrich

Competence Certificate
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 apply statistical methods to estimate expected returns, risk and risk densities of different investment instruments. They will know how to apply maximum likelihood and expectation maximization algorithms to estimate linear and non-linear asset pricing models from the fixed-income, equity or option pricing literature. Besides a conceptual understanding, students will implement the estimation algorithms using modern software and learn about current innovations in the macro-finance literature, aiming to price bonds, equity and option markets with explicitly accounting for fundamental economic and monetary policy related risks under no-arbitrage.

Content
See respective lecture

Annotation
See respective lecture

Workload
The total workload for this module is approximately 270 hours. For further information, see respective lecture.

M 4.30 Module: Formal Systems [M-INFO-100799]

Responsible: Prof. Dr. Bernhard Beckert
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	3	1

Mandatory			
T-INFO-101336	Formal Systems	6 CR	Beckert

M 4.31 Module: Foundations of Marketing [M-WIWI-101424]

Responsible: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	9

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

Competence Certificate
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.

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

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

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German	3	7

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

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

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

Prerequisites
None

Competence Goal
Students

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

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

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

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

Recommendation
None

M 4.33 Module: Geometric Basics for Geometry Processing [M-INFO-105735]

Responsible: Prof. Dr. Hartmut Prautzsch
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
3	Grade to a tenth	Each winter term	1 term	German/English	3	2

Mandatory			
T-INFO-111453	Geometric Basics for Geometry Processing	3 CR	Prautzsch

M 4.34 Module: HR Management & Digital Workplace [M-WIWI-105928]

Responsible: Prof. Dr. Alexander Mädche
Prof. Dr. Petra Nieken
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German/English	3	2

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

Competence Certificate
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.

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

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

M 4.35 Module: Human Computer Interaction [M-INFO-107166]

Responsible: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	English	4	1

Mandatory			
T-INFO-114192	Human-Machine-Interaction	6 CR	Beigl
T-INFO-114193	Human-Machine-Interaction Pass	0 CR	Beigl

Competence Certificate
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 8x 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 4.36 Module: Industrial Production I [M-WIWI-101437]

Responsible: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German/English	3	4

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

Competence Certificate
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 4.37 Module: Informatics Seminar [M-INFO-106327]

Responsible: Professorenschaft des Instituts AIFB
Organisation: KIT Department of Informatics
KIT Department of Economics and Management
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
3	Grade to a tenth	Each term	1 term	German/English	3	2

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

M 4.38 Module: Information Security [M-WIWI-104069]

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German	3	4

Mandatory			
T-WIWI-114156	Applied Informatics – Cybersecurity	4,5 CR	Volkamer
T-WIWI-108439	Advanced Lab Security, Usability and Society	4,5 CR	Volkamer

Competence Certificate
Please note that the module can no longer be selected from summer semester 2026.

The module examination takes place in the form of partial examinations on the selected partial achievements of the module, with which the minimum requirement of credit points is fulfilled. The assessment of success is described for each partial examination.

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

Prerequisites
None

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 organisational protective measures, i. e. among other things knows what has to be taken into account when using the individual measures
- Understanding 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 organisational protective measures and standards to be observed for companies.

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

M 4.39 Module: Information Security [M-INFO-106015]

Responsible: Prof. Dr. Hannes Hartenstein
Prof. Dr. Thorsten Strufe
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each summer term	1 term	German	3	2

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

M 4.40 Module: Information Systems & Digital Business [M-WIWI-105981]

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

Organisation: KIT Department of Economics and Management

Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German/English	4	3

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

Competence Certificate
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.

Annotation
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 4.41 Module: Information Systems I [M-WIWI-104820]

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

Organisation: KIT Department of Economics and Management

Part of: Information Systems

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each winter term	1 term	German	1	1

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

Competence Certificate
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 4.42 Module: Information Systems II [M-WIWI-104821]

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

Organisation: KIT Department of Economics and Management

Part of: Information Systems

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each summer term	1 term	German	1	1

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

Competence Certificate
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 4.43 Module: Intellectual Property and Data Protection [M-INFO-101253]

Responsible: N.N.
Organisation: KIT Department of Informatics
Part of: Law (Compulsory Elective Module in Law)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	3	3

Mandatory			
T-INFO-109840	Intellectual Property and Data Protection	6 CR	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 4.44 Module: Introduction in Computer Networks [M-INFO-103455]

Responsible: Prof. Dr. Martina Zitterbart
Organisation: KIT Department of Informatics
Part of: Informatics (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each summer term	1 term	German	2	1

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

M 4.45 Module: Introduction to Artificial Intelligence [M-INFO-106014]

Responsible: TT-Prof. Dr. Pascal Friederich
Prof. Dr. Gerhard Neumann
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each winter term	1 term	German	3	1

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

M 4.46 Module: Introduction to Civil Law [M-INFO-101190]

Responsible: N.N.
Organisation: KIT Department of Informatics
Part of: Law (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each winter term	1 term	German	1	3

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

M 4.47 Module: Introduction to Data and Information Management [M-INFO-105589]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	Grade to a tenth	Each term	1 term	German/English	3	5

Introduction to Data and Information Management (Election: at least 1 item as well as at least 5 credits)			
T-INFO-101317	Deployment of Database Systems	5 CR	Böhm
T-INFO-111400	Database as a Service	5 CR	Böhm
Introduction to Data and Information Management (Election: at most 2 items as well as at most 4 credits)			
T-INFO-103552	Lab: Working with Database Systems	4 CR	Böhm
T-INFO-101977	Selling IT-Solutions Professionally	1,5 CR	Böhm
T-INFO-101975	Consulting in Practice	1,5 CR	Böhm
T-INFO-101976	Project Management in Practice	1,5 CR	Böhm

Prerequisites
None

Competence Goal
The students

- see the necessity of specialised systems for information and data management and are able to define and deploy decision criteria for purchasing such software,
- are aware of the fundamental approaches in information and database systems and are able to judge their potential applications,
- understand database applications and develop simple database applications on their own,
- are able to communicate at a professional level about technical aspects of information and knowledge management

Content
This module aims at exposing students to modern information and database systems. Beyond fundamental theory and concepts, this module covers the deployment of such technology.

M 4.48 Module: Introduction to Operations Research [M-WIWI-101418]

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

Organisation: KIT Department of Economics and Management

Part of: Economics and Management (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each summer term	2 terms	German	1	2

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

Competence Certificate
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 4.49 Module: Introduction to Statistics [M-WIWI-101432]

Responsible: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: Mathematics

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
10	Grade to a tenth	Each term	2 terms	German	1	2

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

Competence Certificate
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 importand discrete and continuous distributions, covariance and correlation, limit distributions

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

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

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

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

Recommendation
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 4.50 Module: Lab Protocol Engineering [M-INFO-101247]

Responsible: Prof. Dr. Martina Zitterbart
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each winter term	1 term	German	3	1

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

M 4.51 Module: Lab: Working with Database Systems [M-INFO-101865]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	pass/fail	Each winter term	1 term	German	3	2

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

M 4.52 Module: Leadership & Sustainable HR-Management [M-WIWI-106860]

Responsible: Prof. Dr. Petra Nieken
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German	3	4

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

Competence Certificate
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.

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

M 4.53 Module: Lego Mindstorms - Practical Course [M-INFO-102557]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	pass/fail	Each winter term	1 term	German	3	2

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

Competence Certificate
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 MicroPythonprogramming 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

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

M 4.54 Module: Machine Learning and Data Science [M-WIWI-105482]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German/English	3	1

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

Competence Certificate
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 4.55 Module: MARS-Based Internship [M-INFO-101245]

Responsible: Prof. Dr.-Ing. Carsten Dachsbacher
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each term	1 term	German/English	3	1

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

Workload
120 h

M 4.56 Module: Mathematics I [M-MATH-104914]

Responsible: Prof. Dr. Andreas Rieder
Prof. Dr. Christian Wieners
Organisation: KIT Department of Mathematics
Part of: Mathematics

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	Grade to a tenth	Each winter term	1 term	German	1	2

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

Competence Certificate
The assessment in this module consists of

1. a nongraded certificate of exercise following §4(3) of the examination regulation from the exercises to mathematics I (1 credit) 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 examiniation.

Annotation
None.

Workload
See German version.

M 4.57 Module: Mathematics II [M-MATH-104915]

Responsible: Prof. Dr. Andreas Rieder
Prof. Dr. Christian Wieners
Organisation: KIT Department of Mathematics
Part of: Mathematics

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	Grade to a tenth	Each summer term	1 term	German	1	2

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

Competence Certificate
The assessment in this module consists of

1. a nongraded certificate of exercise following §4(3) of the examination regulation from the exercises to mathematics II (1 credit) and
2. a written examination of 90 minutes on the lecture mathematics II 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 examiniation.

Workload
See German version.

M 4.58 Module: Mechano-Informatics and Robotics [M-INFO-100757]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each winter term	1 term	German/English	3	1

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

Competence Certificate
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

Recommendation
Attendance at the *Basispraktikums Mobile Roboter* is recommended.

M 4.59 Module: Methodical Foundations of OR [M-WIWI-101936]

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

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	8

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

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

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

Prerequisites
At least one of the courses "Nonlinear Optimization I" 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.

Annotation
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 4.60 Module: Microprocessors I [M-INFO-101183]

Responsible: Prof. Dr. Wolfgang Karl
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
3	Grade to a tenth	Each summer term	1 term	German	3	1

Mandatory			
T-INFO-101972	Microprocessors I	3 CR	Karl

M 4.61 Module: Mobile Computing and Internet of Things [M-INFO-101249]

Responsible: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each winter term	1 term	German	3	2

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

Prerequisites
None

M 4.62 Module: Mobile Robots – Practical Course [M-INFO-101184]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	pass/fail	Each summer term	1 term	German/English	3	2

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

Competence Certificate
see partial achievements (Teilleistung)

Prerequisites
see partial achievements (Teilleistung)

Competence Goal
Students are able to 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 is able to 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
In this practical course, students assemble an ARMURO robot in groups of two. Each student will be provided with their own robot, which they have to put into operation. While using the robots, a new set of problems will be solved each week. The students will need to prepare for each weak given the provided material. Sets of problem be solved using the C language and focus on controlling the robot's sensors and actuators as well as on the generation of reflex-based behavior. The course ends with a race, where the robots have to tackle an obstacle course.

M 4.63 Module: Module Bachelor's Thesis [M-INFO-104875]

Organisation: KIT Department of Informatics
Part of: Bachelor's Thesis

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
15	Grade to a tenth	Each term	1 term	German/English	3	1

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

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 4.64 Module: Operating Systems [M-INFO-101177]

Responsible: Prof. Dr.-Ing. Frank Bellosa
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German	3	2

Mandatory			
T-INFO-101969	Operating Systems	6 CR	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

Recommendation
.

M 4.65 Module: Optimization under Uncertainty [M-WIWI-103278]

Responsible: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Operations Research)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	4

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

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

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

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

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

Competence Goal
The student

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

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

Annotation
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.

Recommendation
Knowledge from the lectures "Introduction to Operations Research I" and "Introduction to Operations Research II" are helpful.

M 4.66 Module: Orientation Exam [M-WIWI-104843]

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

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

Part of: Orientation Exam

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
0	pass/fail	Each term	2 terms	German	3	1

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

Modelled deadline
This module must be passed until the end of the **3. term**.

Prerequisites
None

M 4.67 Module: Practical Course Computer Engineering: Hardware Design [M-INFO-101219]

Responsible: Prof. Dr. Wolfgang Karl
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each winter term	1 term	German	3	2

Mandatory			
T-INFO-102011	Practical Course Computer Engineering: Hardware Design	4 CR	Karl

M 4.68 Module: Practical Course Web Applications and Service-Oriented Architectures (I) [M-INFO-101633]

Responsible: Prof. Dr. Sebastian Abeck
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each winter term	1 term	German	3	2

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

M 4.69 Module: Practical Course: AI for Climate and Weather Predictions [M-INFO-106800]

Responsible: TT-Prof. Dr. Peer Nowack
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Irregular	1 term	English	4	1

Mandatory			
T-INFO-113659	Practical Course: AI for Climate and Weather Predictions	6 CR	Nowack

Competence Certificate
See partial achievements (Teilleistung)

Prerequisites
See partial achievements (Teilleistung)

Competence Goal
Students will be able to
- define current opportunities and challenges in building advanced AI models for climate and weather predictions.
- explain advanced AI model architectures.
- generate and critically assess output of state-of-the-art AI models.
- professionally present their results both orally and in a concise scientific paper.

Content
Students will learn how to work with state-of-the-art AI models for climate science and weather forecasting.

For example, typical AI models will include recent releases of

- Foundation models for climate science and weather forecasting.
- Generative AI models for tasks such as ensemble generation of weather forecasts and of climate change simulations for uncertainty quantification.
- Transformer and graph neural network models for weather forecasting.
- Climate model emulators.

Each student will be able to select from a variety of topics to explore in their practical experiments. These could include, but are not limited to:

- The representation of physical concepts in data-driven AI models (e.g., does the model indirectly learn to “understand physics”?).
- Detecting and understanding failure modes of AI models.
- Forecast accuracy and uncertainty quantification for AI-generated ensembles of simulations.
- Effective solutions to post-processing AI results and/or to modifying AI model architectures.
- Assessing if certain AI architectures perform significantly better for specific tasks.

Workload
In-person introductory session, individual and group meetings, final presentation sessions: 30h

Practical tasks – getting started, implementation, experiments, analysis: 100h

Write up results in the style of a scientific paper and preparation of final presentation: 50h

Recommendation
- Knowledge of the Python programming language.
- Good knowledge of mathematical concepts such as linear algebra is an advantage.
- An interest in scientific questions around climate science and weather forecasting.

M 4.70 Module: Practical Course: Managing Scientific Data [M-INFO-106311]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	pass/fail	Irregular	1 term	German	3	1

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

M 4.71 Module: Programming [M-INFO-101174]

Responsible: Prof. Dr.-Ing. Anne Koziolek
Prof. Dr. Ralf Reussner
Organisation: KIT Department of Informatics
Part of: Informatics (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Each winter term	1 term	German	1	1

Mandatory			
T-INFO-101967	Programming Pass	0 CR	Koziolek, Reussner
T-INFO-101531	Programming	5 CR	Koziolek, 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)

M 4.72 Module: Public Finance [M-WIWI-101403]

Responsible: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Economics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	7

Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-102877	Introduction to Public Finance	4,5 CR	Wigger
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CR	Gutekunst, Wigger
T-WIWI-102739	Public Revenues	4,5 CR	Wigger

Competence Certificate
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offerd at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

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

Competence Goal
The student

- has advanced knowledge of the theory and policy of taxation and public debt.
- understand the scope, structure and forms of government borrowing.
- is familiar with the structure of German and international tax law
- is able to interpret and motivate fiscal policy issues.

Content
As a branch of Economics, Public Finance is concerned with the theory and policy of the public sector and its interrelations with the private sector. It analyzes the economic role of the state from a normative as well as from a positive point of view. The normative view examines efficiency- and equity-oriented motives for government intervention and develops fiscal policy guidelines. The positive view explains the actual behavior of economic agents in public sector affairs. Special fields of Public Finance are public revenues, i.e. taxes and public debt, public expenditures for publicly provided goods, and welfare programs.

Annotation
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.

Recommendation
It is recommended to attend the course 2560129 after having completed the course 2560120.

M 4.73 Module: Robotics I - Introduction to Robotics [M-INFO-107162]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	English	4	1

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

Competence Certificate
See partial achivements (Teilleistung)

Prerequisites
See partial achivements (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 4.74 Module: Semantic Knowledge Management [M-WIWI-101438]

Responsible: Dr.-Ing. Tobias Käfer
Organisation: KIT Department of Economics and Management
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	10

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

Competence Certificate
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.

Annotation
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 4.75 Module: Seminar Module Economic Sciences [M-WIWI-101826]

Responsible: Studiendekan des KIT-Studienganges
Organisation: KIT Department of Economics and Management
Part of: Seminars

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
3	Grade to a tenth	Each term	1 term	German	3	1

Compulsory Elective Courses (Election: 1 item)			
T-WIWI-103486	Seminar in Business Administration (Bachelor)	3 CR	Professorenschaft des Fachbereichs Betriebswirtschaftslehre
T-WIWI-103488	Seminar in Operations Research (Bachelor)	3 CR	Nickel, Rebennack, Stein
T-WIWI-103489	Seminar in Statistics (Bachelor)	3 CR	Grothe, Schienle
T-WIWI-103487	Seminar in Economics (Bachelor)	3 CR	Professorenschaft des Fachbereichs Volkswirtschaftslehre

Competence Certificate
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 consists of a seminar thematically related to economics. A list of approved courses will be announced on the Internet.

The teaching of the DFG Code "Guidelines for Safeguarding Good Research Practice" takes place within the online course "Good Scientific Practice" of the KIT Library, which can be completed in self-study.

Annotation
The mentioned seminars in this module handbook are place holders. For each semester, a complete list of seminars are published in the Vorlesungsverzeichnis or at the web pages of the participating institutes. Often, the seminar topics for a given semester are publishedat the end of the preceding semester. Some seminars require an early sign-in deadline at the end of the of the preceding semester.

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

M 4.76 Module: Seminar Module Informatics [M-INFO-102058]

Responsible: Professorenschaft des Instituts AIFB
Organisation: KIT Department of Informatics
KIT Department of Economics and Management
Part of: Seminars

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
3	Grade to a tenth	Each term	1 term	German/English	3	1

Seminar Informatics (Election: 1 item)			
T-INFO-104336	Seminar Informatics A	3 CR	Abeck
T-WIWI-103485	Seminar in Informatics (Bachelor)	3 CR	Professorenschaft des Instituts AIFB

M 4.77 Module: Seminar Module Law [M-INFO-101218]

Responsible: N.N.
Organisation: KIT Department of Informatics
Part of: Seminars

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
3	Grade to a tenth	Each term	1 term	German	3	1

Mandatory			
T-INFO-101997	Seminar: Legal Studies I	3 CR	N.N.

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 4.78 Module: Software Engineering I [M-INFO-101175]

Responsible: Prof. Dr.-Ing. Ina Schaefer
Organisation: KIT Department of Informatics
Part of: Informatics (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	German	2	1

Mandatory			
T-INFO-101968	Software Engineering I	6 CR	Schaefer
T-INFO-101995	Software Engineering I Pass	0 CR	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 4.79 Module: Software Engineering II [M-INFO-107235]

Responsible: Prof. Dr.-Ing. Anne Koziolek
Prof. Dr. Raffaela Mirandola
Prof. Dr. Ralf Reussner

Organisation: KIT Department of Informatics

Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each summer term	1 term	English	4	1

Mandatory			
T-INFO-114259	Software Engineering II	6 CR	Koziolek, Mirandola, Reussner

Competence Certificate
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

Annotation
The Software Engineering II module is a basic module.

Workload
Preparation and follow-up time 1.5 h / 1 SWS

Total workload:
(4 SWS + 1.5 x 4 SWS) x 15 + 30 h exam preparation = 180 h = 6 ECTS

M 4.80 Module: Statistics and Econometrics [M-WIWI-101599]

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

Organisation: KIT Department of Economics and Management

Part of: Economics and Management (Statistics)
Economics and Management (Economics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	3	6

Mandatory			
T-WIWI-102736	Economics III: Introduction in Econometrics	5 CR	Schienle
Supplementary Courses (Election: between 1 and 2 items)			
T-WIWI-103063	Analysis of Multivariate Data	4,5 CR	Grothe
T-WIWI-103064	Financial Econometrics	4,5 CR	Schienle
T-WIWI-110939	Financial Econometrics II	4,5 CR	Schienle
T-WIWI-112153	Microeconometrics	4,5 CR	Krüger
T-WIWI-103065	Statistical Modeling of Generalized Regression Models	4,5 CR	Heller

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

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

Prerequisites
The course "Economics III: Introduction in Econometrics“ is compulsory and must be examined. In case the course „Economics III: Introduction in Econometrics“ has already been examined within the module „Applied Microeconomics“, the course „Economics III: Introduction in Econometrics“ is not compulsory.

Competence Goal
The student

- shows an advanced understanding of Econometric techniques and statistical model building.
- is able to develop Econometric models for applied problems based on available data
- is able to apply techniques and models with statistical software, to interpret results and to judge on different approaches with appropriate statistical criteria.

Content
The courses provide a solid Econometric and statistical foundation of techiques necessary to conduct valid regression, time series and multivariate analysis.

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

M 4.81 Module: Statistics and Econometrics II [M-WIWI-105414]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German	4	5

Compulsory Elective Courses (Election:)			
T-WIWI-103063	Analysis of Multivariate Data	4,5 CR	Grothe
T-WIWI-103064	Financial Econometrics	4,5 CR	Schienle
T-WIWI-110939	Financial Econometrics II	4,5 CR	Schienle
T-WIWI-112153	Microeconometrics	4,5 CR	Krüger
T-WIWI-103065	Statistical Modeling of Generalized Regression Models	4,5 CR	Heller

Competence Certificate
The assessment is carried out as partial exams of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

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

Prerequisites
The following module must have been started: Statistics and Econometrics [M-WIWI-101599].

Competence Goal
The student

- shows an advanced understanding of Econometric techniques and statistical model building.
- is able to develop advanced Econometric models for applied problems based on available data
- is able to apply techniques and models efficiently with statistical software, to interpret results and to judge on different approaches with appropriate statistical criteria.

Content
The courses provide foundations of advanced Econometric and statistical techiques for regression, time series and multivariate analysis.

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

M 4.82 Module: Strategy and Organization [M-WIWI-101425]

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	2 terms	German	3	6

Strategy and Organization (Election: at least 9 credits)			
T-WIWI-102630	Managing Organizations	3,5 CR	Lindstädt
T-WIWI-102871	Problem Solving, Communication and Leadership	2 CR	Lindstädt
T-WIWI-113090	Strategic Management	3,5 CR	Lindstädt

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

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

Competence Goal

- The student can prepare strategic decisions along the ideal-typical strategy process and classify them strategically.
- He/she evaluates the strengths and weaknesses of existing organizational structures and regulations using systematic criteria and can review the management of organizational change.
- The student can effectively carry out decision-making by structuring problems and communicating solutions, taking into account the situation and the personalities involved.
- Through intensive exposure to a variety of practice-relevant case studies, students learn to apply and discuss theoretical course content to real-life situations.

Content
The module has a practical and action-oriented structure. Students become familiar with central frameworks of strategic management along the ideal-typical strategy process. An overview of fundamental models will be given, and an action-oriented integration performance will be achieved through the transfer of theory to practical issues. In addition, students learn concepts for the design of organizational structures, regulation of organizational processes as well as control of organizational changes. This enables a well-founded assessment of existing organizational structures and regulations. Furthermore, participants are enabled to recognize, structure, analyze and effectively communicate problems. In addition, central leadership concepts are taught that address the influence of the situation, the leadership personality and the characteristics of those being led.

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

M 4.83 Module: Supply Chain Management [M-WIWI-101421]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	11

Mandatory			
T-WIWI-107506	Platform Economy	4,5 CR	Weinhardt
Supplementary Courses (Election: 1 item)			
T-WIWI-102704	Facility Location and Strategic Supply Chain Management	4,5 CR	Nickel
T-WIWI-102714	Tactical and Operational Supply Chain Management	4,5 CR	Nickel

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

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

Prerequisites
The courseT-WIWI-107506 "Platform Economy"has to be taken.

Competence Goal
The students

- are able to understand and evaluate the control of cross-company supply chains based on a strategic and operative view,
- are able to analyse the coordination problems within the supply chains,
- are able to identify and integrate adequate information system infrastructures to support the supply chains,
- are able to apply theoretical methods from the operations research and the information management,
- learn to elaborate solutions in a team

Content
The module "Supply Chain Management" gives an overview of the mutual dependencies of information systems and of supply chains spanning several enterprises. The specifics of supply chains and their information needs set new requirements for the operational information management. In the core lecture "Platform Economy" the focus is set on markets between two parties that act through an intermediary on an Internet platform. Topics discussed are network effects, peer-to-peer markets, blockchains and market design. The course is held in English and teaches parts of the syllabus with the support of a case study in which students analyze a platform.

The module is completed by an elective course addressing appropriate optimization methods for the Supply Chain Management and for modern logistic approaches.

Annotation
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 4.84 Module: Surfaces for Computer Aided Design [M-INFO-101254]

Responsible: Prof. Dr. Hartmut Prautzsch
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
5	Grade to a tenth	Irregular	1 term	German	3	1

Mandatory			
T-INFO-102073	Surfaces for Computer aided Design	5 CR	Prautzsch

Competence Goal
Die Hörer und Hörerinnen der Vorlesung können grundlegende CAGD-Techniken für praktische und theoretische Arbeiten auf entsprechenden Gebieten anwenden und sind in der Lage die Qualitität von CAGD-Lösungen zu beurteilen.

Brauchen Sie dann noch für alle meine anderen Module Qualifikationsziele? Für alle diese Module wurden bislang noch keine Qualifikationsziele formuliert.

Content
Bézier and B-spline-Technics, for tensorproduct- and triangular surface patches: de Casteljau algorithm, convex surfaces, subdivision, smooth surface joints, Powell-Sabin, Clough-Tocher and Piper's elements, construction of smooth freeform surfaces, vertex enclosure problem, boxsplines.

M 4.85 Module: Team Project Software Development [M-INFO-104809]

Responsible: Prof. Dr. Sebastian Abeck
Prof. Dr. Ralf Reussner
Organisation: KIT Department of Informatics
Part of: Information Systems

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	Grade to a tenth	Each term	1 term	German	3	1

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

M 4.86 Module: Telematics [M-INFO-107243]

Responsible: Prof. Dr. Martina Zitterbart
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	English	4	1

Mandatory			
T-INFO-114269	Telematics	6 CR	Zitterbart

Competence Certificate
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 4.87 Module: Theoretical Informatics [M-INFO-101189]

Responsible: Prof. Dr. Jörn Müller-Quade
Prof. Dr. Dorothea Wagner
Organisation: KIT Department of Informatics
Part of: Informatics (mandatory)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
6	Grade to a tenth	Each winter term	1 term	German/English	2	1

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

Competence Certificate
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 4.88 Module: Topics in Finance I [M-WIWI-101465]

Responsible: Prof. Dr. Martin Ruckes
Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	11

Compulsory Elective Courses (Election:)			
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-107505	Financial Accounting for Global Firms	4,5 CR	Luedecke
T-WIWI-102623	Financial Intermediation	4,5 CR	Ruckes
T-WIWI-112694	FinTech	4,5 CR	Thimme
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CR	Gutekunst, Wigger
T-WIWI-102646	International Finance	3 CR	Uhrig-Homburg

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

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

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

In addition to that it is possible to choose the module *Topics in Finance II*.

Competence Goal
The student

- has advanced skills in modern finance
- is able to apply these skills in practice in the fields of finance and accounting, financial markets and banking

Content
The module *Topics in Finance I* is based on the module *Essentials of Finance*. The courses deal with advanced issues concerning the fields of finance and accounting, financial markets and banking from a theoretical and practical point of view.

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

M 4.89 Module: Topics in Finance II [M-WIWI-101423]

Responsible: Prof. Dr. Martin Ruckes
Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: Economics and Management (Business Administration)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
9	Grade to a tenth	Each term	1 term	German/English	3	10

Election notes

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This module will not count towards the degree until the module *Essentials in Finance* has also been successfully completed. The Essentials *in Finance* module may not be booked out as an additional examination.

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Compulsory Elective Courses (Election: 9 credits)			
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-102623	Financial Intermediation	4,5 CR	Ruckes
T-WIWI-107505	Financial Accounting for Global Firms	4,5 CR	Luedecke
T-WIWI-112694	FinTech	4,5 CR	Thimme
T-WIWI-102626	Business Strategies of Banks	3 CR	Müller
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CR	Gutekunst, Wigger
T-WIWI-102646	International Finance	3 CR	Uhrig-Homburg

Competence Certificate

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

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

Prerequisites

It is only possible to choose this module in combination with the module *Essentials in Finance*. The module is passed only after the final partial exam of *Essentials in Finance* is additionally passed.

In addition to that it is possible to choose the module *Topics in Finance I*.

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.

Annotation

The course T-WIWI-102790 "Special Taxation" will no longer be offered in the module as of winter semester 2018/1019.

Workload

The total workload for this module is approximately 270 hours.

M 4.90 Module: Web Applications and Service-Oriented Architectures (I) [M-INFO-101636]

Responsible: Prof. Dr. Sebastian Abeck
Organisation: KIT Department of Informatics
Part of: Informatics (Compulsory Elective Modules in Informatics)

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
4	Grade to a tenth	Each winter term	1 term	German	3	1

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

5 Courses

T 5.1 Course: Advanced Lab Informatics (Bachelor) [T-WIWI-110541]

Responsible: Professorenschaft des Instituts AIFB
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101476 - Business Processes and Information Systems
M-WIWI-101438 - Semantic Knowledge Management

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each term	1

Events					
WT 24/25	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / 🧩	Toussaint, Schiefer, Schüler
WT 24/25	2512400	Practical Course Sociotechnical Information Systems Development (Bachelor)	3 SWS	Practical course / 💻	Sunyaev, Goram, Leiser
WT 24/25	2512554	Praktikum Security, Usability and Society (Bachelor)	3 SWS	Practical course / 🧩	Volkamer, Strufe, Berens, Morisco, Fallahi, Ballreich, Hennig, Länge, Mossano
WT 24/25	2512555	Praktikum Security, Usability and Society (Master)	3 SWS	Practical course / 🧩	Volkamer, Strufe, Berens, Fallahi, Morisco, Ballreich, Hennig, Länge, Mossano
ST 2025	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / 🗣	Schiefer, Toussaint, Ullrich
ST 2025	2512554	Practical lab Security, Usability and Society (Bachelor)	3 SWS	Practical course / 🧩	Volkamer, Strufe, Berens, Mossano, Hennig, Veit, Länge, Fallahi
Exams					
WT 24/25	7900047	Advanced Lab Realization of Innovative Services (Bachelor)			Oberweis
WT 24/25	7900080	Advanced Lab Development of Sociotechnical Information Systems (Bachelor)			Sunyaev
WT 24/25	7900116	Advanced Lab Security, Usability and Society (Bachelor)			Volkamer

Legend: 💻 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Annotation
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 events related to this course:

V **Lab Realisation of innovative services (Bachelor)**
2512204, WS 24/25, 3 SWS, Language: German, Open in study portal
Practical course (P)
Blended (On-Site/Online)

Content
As part of the lab, the participants should work together in small groups to realize innovative services (mainly for students).

Organizational issues
Informationen zu Themen und die Anmeldung erfolgt vor Praktikumsbeginn im Wiwi-Portal
https://portal.wiwi.kit.edu/ys

V **Praktikum Security, Usability and Society (Bachelor)**
2512554, WS 24/25, 3 SWS, Language: German/English, Open in study portal
Practical course (P)
Blended (On-Site/Online)

Content
English:

The Praktikum Security, Usability and Society will cover topics both of usable security and privacy programming, and how to conduct user studies. To reserve a place, please, register on the WiWi portal and send an email with your chosen topic, plus a back-up one, to mattia.mossano@kit.edu . Topics are assigned first-come-first-served until all of them are filled. Topics in italics have already been assigned.

Application deadline 25.10.2024
Assignment 30.10.2024
Confirmation deadline 03.11.2024

Important dates:

Kick-off: 23.10.2024, 09:00 AM CET in Big Blue Button - Link and Kronenplatz 5.20, 3A-11.1

Report & code feedback deadline: 26.01.2025, 23:59 CET
Feedback on Report & code: 10.02.2025, 23:59 CET
Final report + code deadline: 17.02.2025, 23:59 CET

Presentation draft deadline: 23.02.2025, 23:59 CET
Feedback on presentation draft: 28.02.2025, 23:59 CET
Final presentation deadline: 07.03.2025, 23:59 CET

Presentation day: 11.03.2025, 09:00 CET

Topics:

Privacy Friendly Apps

In this area, students complete an app (or an extension of an app) among our Privacy-Friendly Apps. Please click the following link to know more about them: https://secuso.aifb.kit.edu/english/105.php . Students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

Title: NoPhish App Rework
Number of students: 2 Ba/Ma
Description: The NoPhish app was one of the first measures from the NoPhish concept. The app has been around for a long time and has not been updated since then. Accordingly, the task of the project is to make the app functional for the current Android version. The app is also to be optimized so that updates, e.g. new chapters, can be added easily.

Designing Security User studies

These topics are related to how to set up and conduct user studies of various types. Online studies, interviews and lab studies are possible. At the end of the semester, the students present a report / paper and a talk in which they present their methodologies and the results of small pre-studies.

Title: IT-Security and Privacy Studies in the health sector
Number of students: 1 Ba/Ma
Description: Cyberattacks in the healthcare sector are on the rise and medical facilities are increasingly becoming the target of hacker attacks. This often affects sensitive patient data or, in the event of a cyberattack, patient care. The German Federal Office for Information Security (BSI) reports that “[t]he security situation of the IT infrastructure of medical practices in Germany [...] has hardly been studied to date.” The aim of the work is to find out which scientific studies already exist in the field of IT security and privacy and which best practices can be derived from these studies, e.g. on the subject of recruitment, study design or consideration of special needs.

Title: Understanding Privacy and Security Risk Awareness Among Sports Science Students at KIT
Number of students: 1 Ba/Ma
Description: Privacy and Security Awareness in Data Handling: The key issue is that many sports science students may not fully understand the privacy and security risks involved in handling sensitive data. As students increasingly deal with personal and research-related information, gaps in their awareness of data protection, such as risks of data breaches or misuse, can lead to significant vulnerabilities. The aim of the task is to design a survey that assesses their current understanding of these risks, helping to identify areas where further education or guidance is needed.

Run Usable Security Studies and Results Analysis

These topics are related to run and analyze the results of user-studies. Online studies, interviews and lab studies are all possible, depending on the topic. At the end of the semester, the students present a report / paper with the analyses conducted and a talk in which they present the results.

Title: Visualization of Eye Gaze Patterns during Authentication Tasks
Number of students: 1 Ba/Ma
Description: In this project, students will analyze and visualize eye gaze data collected during two specific authentication tasks: the Dot Task and the Slider Task. The primary objective is to represent subjects' eye movements visually, enhancing the understanding of gaze patterns during the authentication process. *Dot Task Visualization:* For the Dot Task, participants were instructed to focus on a sequence of dots displayed on a screen. The dataset includes the positions of these dots and the corresponding gaze locations of the subjects. The student's task is to create a dynamic visualization that not only represents these positions accurately but also illustrates the sequence in which the dots were focused on by the subjects. *Slider Task Visualization:* The Slider Task involved presenting participants with a series of images, for which both the images' locations on the screen and the subjects' gaze locations are recorded. The challenge is to develop a heatmap visualization based on this data, effectively demonstrating the concentration and dispersion of gaze points across different images.

Title: Compare BSI Phishing Game with the NoPhish Game
Number of students: 1 Ba
Description: The NoPhish app, one of the first implementations of the NoPhish concept, is a form of serious game. The BSI has also developed a game in the field of phishing. Both "games" use different approaches to impart knowledge from the same context. The aim is to evaluate the two games in terms of similarities and differences.

Title: Chatbots for Literature Reviews
Number of students: 1 Ba
Description: Chatbots are becoming increasingly popular and are already being used in various areas. But in what form can these bots be used for science? The variety of chatbots also raises the question of whether there are chatbots that are better suited to a scientific context. The aim is to identify a selection of chatbots and evaluate them in terms of their effectiveness for future literature research. To this end, the results of the chatbots will be compared with the ACM database in order to check their effectiveness for finding literature for a specific period of time.

Title: Phishing Advice from Organizations (English Only)
Number of students: 1 Ba/Ma
Description: Many companies distribute information on how to recognize phishing via various channels such as e-mails, e.g. Amazon or Telekom. The question arises as to how helpful these tips are in reality. Are they too specific to the context of the company or so abstractly formulated that they are of no real help to users? The aim of the work is to collect various hints and then compare them with the hints of the NoPhish concept in order to find differences and similarities between the hints and the concept.

Title: How do website owners become aware that their website was hacked?
Number of students: 1 Ba/Ma
Description: We identified website owners that were affected by a hack on their website and sent them a notification. During the course of the notification process, we also identified several websites who seemingly remediated the hack before our notification. We now wanted to find out, how those website owners got aware of the hack. If they were notified by a third party, we would also like to know how and by whom they were notified and what their feelings were with respect to the notification.

Title: Cognitive Walkthrough for applying, installing, and using an S/MIME certificate at KIT
Number of students: 1-2 Ba/Ma
Description: The main application of S/MIME is the encryption and signing of e-mail messages. The KIT offers all members the opportunity to have S/MIME certificates issued and has recently started using a new process of the European research network GÉANT for this purpose. The aim of this work is to carry out a cognitive walkthrough with members of the KIT to apply for, set up and use S/MIME certificates and to identify problem areas and obstacles.

Title: Anti-phishing information presented in medias and anti-phishing channels (English only)
Number of students: 1 Ba
Description: Several different channels exists to disseminate information about phishing, be it recent major campaigns or more specific recommendations. Some of these are through social networks accounts, others are specific webpages created "ad hoc" by certain organizations (e.g., Action Fraud in the UK, the BSI). The goal of this topic is to conduct a media review of several channels, collect the data, and compare it with results from a previous iteration of this same topic.

This event counts towards the KASTEL certificate. Further information on how to obtain the certificate can be found on the SECUSO website https://secuso.aifb.kit.edu/Studium_und_Lehre.php) .

V **Praktikum Security, Usability and Society (Master)** **Practical course (P)**
2512555, WS 24/25, 3 SWS, Language: German/English, Open in study portal **Blended (On-Site/Online)**

Content
English:

The Praktikum Security, Usability and Society will cover topics both of usable security and privacy programming, and how to conduct user studies. To reserve a place, please, register on the WiWi portal and send an email with your chosen topic, plus a back-up one, to mattia.mossano@kit.edu . Topics are assigned first-come-first-served until all of them are filled. Topics in italics have been already assigned.

Application deadline 25.10.2024
Assignment 30.10.2024
Confirmation deadline 03.11.2024

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Final report + code deadline: 17.02.2025, 23:59 CET

Presentation draft deadline: 23.02.2025, 23:59 CET
Feedback on presentation draft: 28.02.2025, 23:59 CET
Final presentation deadline: 07.03.2025, 23:59 CET

Presentation day: 11.03.2025, 09:00 CET

Topics:

Privacy Friendly Apps

In this area, students complete an app (or an extension of an app) among our Privacy-Friendly Apps. Please click the following link to know more about them: https://secuso.aifb.kit.edu/english/105.php . Students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

Title: NoPhish App Rework
Number of students: 2 Ba/Ma
Description: The NoPhish app was one of the first measures from the NoPhish concept. The app has been around for a long time and has not been updated since then. Accordingly, the task of the project is to make the app functional for the current Android version. The app is also to be optimized so that updates, e.g. new chapters, can be added easily.

Designing Security User studies

These topics are related to how to set up and conduct user studies of various types. Online studies, interviews and lab studies are possible. At the end of the semester, the students present a report / paper and a talk in which they present their methodologies and the results of small pre-studies.

Title: Usability of Password Managers in Virtual Reality
Number of students: 2 Ma
Description: The pre-dominant form of authentication in Virtual Reality (VR) are passwords. Passwords create a burden for users in the VR environment because of special input methods and the virtual keyboard [Stephenson, S. et al (2022). SoK: Authentication in Augmented and Virtual Reality]. Password Managers (PMs) can support the user with handling this problem [Mayer, P. et al. (2022). Why Users (Don't) Use Password Managers at a Large Educational Institution]. They offer auto-filling features, store credentials in an overview or generate complex and secure passwords. Especially in the VR context, where typing a password is slow and complex, PMs can be beneficial. We want to explore the different PMs in VR and test the usability to find challenges and possible solutions.

Title: IT-Security and Privacy Studies in the health sector
Number of students: 1 Ba/Ma
Description: Cyberattacks in the healthcare sector are on the rise and medical facilities are increasingly becoming the target of hacker attacks. This often affects sensitive patient data or, in the event of a cyberattack, patient care. The German Federal Office for Information Security (BSI) reports that “[t]he security situation of the IT infrastructure of medical practices in Germany [...] has hardly been studied to date.” The aim of the work is to find out which scientific studies already exist in the field of IT security and privacy and which best practices can be derived from these studies, e.g. on the subject of recruitment, study design or consideration of special needs.

Title: Understanding Privacy and Security Risk Awareness Among Sports Science Students at KIT
Number of students: 1 Ba/Ma
Description: Privacy and Security Awareness in Data Handling: The key issue is that many sports science students may not fully understand the privacy and security risks involved in handling sensitive data. As students increasingly deal with personal and research-related information, gaps in their awareness of data protection, such as risks of data breaches or misuse, can lead to significant vulnerabilities. The aim of the task is to design a survey that assesses their current understanding of these risks, helping to identify areas where further education or guidance is needed.

Run Usable Security Studies and Results Analysis

These topics are related to run and analyze the results of user-studies. Online studies, interviews and lab studies are all possible, depending on the topic. At the end of the semester, the students present a report / paper with the analyses conducted and a talk in which they present the results.

Title: Visualization of Eye Gaze Patterns during Authentication Tasks
Number of students: 1 Ba/Ma
Description: In this project, students will analyze and visualize eye gaze data collected during two specific authentication tasks: the Dot Task and the Slider Task. The primary objective is to represent subjects' eye movements visually, enhancing the understanding of gaze patterns during the authentication process. *Dot Task Visualization:* For the Dot Task, participants were instructed to focus on a sequence of dots displayed on a screen. The dataset includes the positions of these dots and the corresponding gaze locations of the subjects. The student's task is to create a dynamic visualization that not only represents these positions accurately but also illustrates the sequence in which the dots were focused on by the subjects. *Slider Task Visualization:* The Slider Task involved presenting participants with a series of images, for which both the images' locations on the screen and the subjects' gaze locations are recorded. The challenge is to develop a heatmap visualization based on this data, effectively demonstrating the concentration and dispersion of gaze points across different images.

Title: Phishing Advice from Organizations (English Only)
Number of students: 1 Ba/Ma
Description: Many companies distribute information on how to recognize phishing via various channels such as e-mails, e.g. Amazon or Telekom. The question arises as to how helpful these tips are in reality. Are they too specific to the context of the company or so abstractly formulated that they are of no real help to users? The aim of the work is to collect various hints and then compare them with the hints of the NoPhish concept in order to find differences and similarities between the hints and the concept.

Title: How do website owners become aware that their website was hacked?
Number of students: 1 Ba/Ma
Description: We identified website owners that were affected by a hack on their website and sent them a notification. During the course of the notification process, we also identified several websites who seemingly remediated the hack before our notification. We now wanted to find out, how those website owners got aware of the hack. If they were notified by a third party, we would also like to know how and by whom they were notified and what their feelings were with respect to the notification.

Title: Cognitive Walkthrough for applying, installing, and using an S/MIME certificate at KIT
Number of students: 1-2 Ba/Ma
Description: The main application of S/MIME is the encryption and signing of e-mail messages. The KIT offers all members the opportunity to have S/MIME certificates issued and has recently started using a new process of the European research network GÉANT for this purpose. The aim of this work is to carry out a cognitive walkthrough with members of the KIT to apply for, set up and use S/MIME certificates and to identify problem areas and obstacles.

This event counts towards the KASTEL certificate. Further information on how to obtain the certificate can be found on the SECUSO website https://secuso.aifb.kit.edu/Studium_und_Lehre.php) .

V **Lab Realisation of innovative services (Bachelor)** **Practical course (P)**
2512204, SS 2025, 3 SWS, Language: German, Open in study portal **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 vor Praktikumsbeginn im Wiwi-Portal
https://portal.wiwi.kit.edu/ys

V **Practical lab Security, Usability and Society (Bachelor)** **Practical course (P)**
2512554, SS 2025, 3 SWS, Language: English, Open in study portal **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 5.2 Course: Advanced Lab Realization of Innovative Services (Bachelor) [T-WIWI-112915]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101476 - Business Processes and Information Systems

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each term	1

Events					
WT 24/25	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / 🖧	Toussaint, Schiefer, Schüler
ST 2025	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / 🗣	Schiefer, Toussaint, Ullrich
Exams					
WT 24/25	7900047	Advanced Lab Realization of Innovative Services (Bachelor)			Oberweis

Legend: 🖥 Online, 🖧 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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.

Annotation
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 events related to this course:

V Lab Realisation of innovative services (Bachelor)

2512204, WS 24/25, 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 2025, 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 vor Praktikumsbeginn im Wiwi-Portal
https://portal.wiwi.kit.edu/ys

T 5.3 Course: Advanced Lab Security, Usability and Society [T-WIWI-108439]

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-104069 - Information Security

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	see Annotations	2

Events					
WT 24/25	2512554	Praktikum Security, Usability and Society (Bachelor)	3 SWS	Practical course / 🧩	Volkamer, Strufe, Berens, Morisco, Fallahi, Ballreich, Hennig, Länge, Mossano
WT 24/25	2512555	Praktikum Security, Usability and Society (Master)	3 SWS	Practical course / 🧩	Volkamer, Strufe, Berens, Fallahi, Morisco, Ballreich, Hennig, Länge, Mossano
ST 2025	2512554	Practical lab Security, Usability and Society (Bachelor)	3 SWS	Practical course / 🧩	Volkamer, Strufe, Berens, Mossano, Hennig, Veit, Länge, Fallahi
ST 2025	2512555	Praktikum Security, Usability and Society (Master)	3 SWS	Practical course / 🧩	Volkamer, Strufe, Berens, Mossano, Hennig, Veit, Länge
Exams					
WT 24/25	7900116	Advanced Lab Security, Usability and Society (Bachelor)			Volkamer
WT 24/25	7900307	Advanced Lab Security, Usability and Society (Master)			Volkamer

Legend: 💻 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The alternative exam assessment consists of:

- a practical work
- a presentation and possibly
- a written seminar thesis

Practical work, presentation and written thesis are weighted according to the course.

Prerequisites
None

Recommendation
Knowledge from the lecture "Information Security" is recommended.

Annotation
The course will not be offered in the summer semester 2023.

Workload
135 hours

Below you will find excerpts from events related to this course:

V **Praktikum Security, Usability and Society (Bachelor)** — **Practical course (P)**
2512554, WS 24/25, 3 SWS, Language: German/English, Open in study portal — **Blended (On-Site/Online)**

Content
English:

The Praktikum Security, Usability and Society will cover topics both of usable security and privacy programming, and how to conduct user studies. To reserve a place, please, register on the WiWi portal and send an email with your chosen topic, plus a back-up one, to mattia.mossano@kit.edu . Topics are assigned first-come-first-served until all of them are filled. Topics in italics have already been assigned.

Application deadline 25.10.2024
Assignment 30.10.2024
Confirmation deadline 03.11.2024

Important dates:

Kick-off: 23.10.2024, 09:00 AM CET in Big Blue Button - Link and Kronenplatz 5.20, 3A-11.1

Report & code feedback deadline: 26.01.2025, 23:59 CET
Feedback on Report & code: 10.02.2025, 23:59 CET
Final report + code deadline: 17.02.2025, 23:59 CET

Presentation draft deadline: 23.02.2025, 23:59 CET
Feedback on presentation draft: 28.02.2025, 23:59 CET
Final presentation deadline: 07.03.2025, 23:59 CET

Presentation day: 11.03.2025, 09:00 CET

Topics:

Privacy Friendly Apps

In this area, students complete an app (or an extension of an app) among our Privacy-Friendly Apps. Please click the following link to know more about them: https://secuso.aifb.kit.edu/english/105.php . Students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

Title: NoPhish App Rework
Number of students: 2 Ba/Ma
Description: The NoPhish app was one of the first measures from the NoPhish concept. The app has been around for a long time and has not been updated since then. Accordingly, the task of the project is to make the app functional for the current Android version. The app is also to be optimized so that updates, e.g. new chapters, can be added easily.

Designing Security User studies

These topics are related to how to set up and conduct user studies of various types. Online studies, interviews and lab studies are possible. At the end of the semester, the students present a report / paper and a talk in which they present their methodologies and the results of small pre-studies.

Title: IT-Security and Privacy Studies in the health sector
Number of students: 1 Ba/Ma
Description: Cyberattacks in the healthcare sector are on the rise and medical facilities are increasingly becoming the target of hacker attacks. This often affects sensitive patient data or, in the event of a cyberattack, patient care. The German Federal Office for Information Security (BSI) reports that “[t]he security situation of the IT infrastructure of medical practices in Germany [...] has hardly been studied to date.” The aim of the work is to find out which scientific studies already exist in the field of IT security and privacy and which best practices can be derived from these studies, e.g. on the subject of recruitment, study design or consideration of special needs.

Title: Understanding Privacy and Security Risk Awareness Among Sports Science Students at KIT
Number of students: 1 Ba/Ma
Description: Privacy and Security Awareness in Data Handling: The key issue is that many sports science students may not fully understand the privacy and security risks involved in handling sensitive data. As students increasingly deal with personal and research-related information, gaps in their awareness of data protection, such as risks of data breaches or misuse, can lead to significant vulnerabilities. The aim of the task is to design a survey that assesses their current understanding of these risks, helping to identify areas where further education or guidance is needed.

Run Usable Security Studies and Results Analysis

These topics are related to run and analyze the results of user-studies. Online studies, interviews and lab studies are all possible, depending on the topic. At the end of the semester, the students present a report / paper with the analyses conducted and a talk in which they present the results.

Title: Visualization of Eye Gaze Patterns during Authentication Tasks
Number of students: 1 Ba/Ma
Description: In this project, students will analyze and visualize eye gaze data collected during two specific authentication tasks: the Dot Task and the Slider Task. The primary objective is to represent subjects' eye movements visually, enhancing the understanding of gaze patterns during the authentication process. *Dot Task Visualization:* For the Dot Task, participants were instructed to focus on a sequence of dots displayed on a screen. The dataset includes the positions of these dots and the corresponding gaze locations of the subjects. The student's task is to create a dynamic visualization that not only represents these positions accurately but also illustrates the sequence in which the dots were focused on by the subjects. *Slider Task Visualization:* The Slider Task involved presenting participants with a series of images, for which both the images' locations on the screen and the subjects' gaze locations are recorded. The challenge is to develop a heatmap visualization based on this data, effectively demonstrating the concentration and dispersion of gaze points across different images.

Title: Compare BSI Phishing Game with the NoPhish Game
Number of students: 1 Ba
Description: The NoPhish app, one of the first implementations of the NoPhish concept, is a form of serious game. The BSI has also developed a game in the field of phishing. Both "games" use different approaches to impart knowledge from the same context. The aim is to evaluate the two games in terms of similarities and differences.

Title: Chatbots for Literature Reviews
Number of students: 1 Ba
Description: Chatbots are becoming increasingly popular and are already being used in various areas. But in what form can these bots be used for science? The variety of chatbots also raises the question of whether there are chatbots that are better suited to a scientific context. The aim is to identify a selection of chatbots and evaluate them in terms of their effectiveness for future literature research. To this end, the results of the chatbots will be compared with the ACM database in order to check their effectiveness for finding literature for a specific period of time.

Title: Phishing Advice from Organizations (English Only)
Number of students: 1 Ba/Ma
Description: Many companies distribute information on how to recognize phishing via various channels such as e-mails, e.g. Amazon or Telekom. The question arises as to how helpful these tips are in reality. Are they too specific to the context of the company or so abstractly formulated that they are of no real help to users? The aim of the work is to collect various hints and then compare them with the hints of the NoPhish concept in order to find differences and similarities between the hints and the concept.

Title: How do website owners become aware that their website was hacked?
Number of students: 1 Ba/Ma
Description: We identified website owners that were affected by a hack on their website and sent them a notification. During the course of the notification process, we also identified several websites who seemingly remediated the hack before our notification. We now wanted to find out, how those website owners got aware of the hack. If they were notified by a third party, we would also like to know how and by whom they were notified and what their feelings were with respect to the notification.

Title: Cognitive Walkthrough for applying, installing, and using an S/MIME certificate at KIT
Number of students: 1-2 Ba/Ma
Description: The main application of S/MIME is the encryption and signing of e-mail messages. The KIT offers all members the opportunity to have S/MIME certificates issued and has recently started using a new process of the European research network GÉANT for this purpose. The aim of this work is to carry out a cognitive walkthrough with members of the KIT to apply for, set up and use S/MIME certificates and to identify problem areas and obstacles.

Title: Anti-phishing information presented in medias and anti-phishing channels (English only)
Number of students: 1 Ba
Description: Several different channels exists to disseminate information about phishing, be it recent major campaigns or more specific recommendations. Some of these are through social networks accounts, others are specific webpages created "ad hoc" by certain organizations (e.g., Action Fraud in the UK, the BSI). The goal of this topic is to conduct a media review of several channels, collect the data, and compare it with results from a previous iteration of this same topic.

This event counts towards the KASTEL certificate. Further information on how to obtain the certificate can be found on the SECUSO website https://secuso.aifb.kit.edu/Studium_und_Lehre.php) .

V **Praktikum Security, Usability and Society (Master)** **Practical course (P)**
2512555, WS 24/25, 3 SWS, Language: German/English, Open in study portal **Blended (On-Site/Online)**

Content
English:

The Praktikum Security, Usability and Society will cover topics both of usable security and privacy programming, and how to conduct user studies. To reserve a place, please, register on the WiWi portal and send an email with your chosen topic, plus a back-up one, to mattia.mossano@kit.edu . Topics are assigned first-come-first-served until all of them are filled. Topics in italics have been already assigned.

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Assignment 30.10.2024
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Presentation day: 11.03.2025, 09:00 CET

Topics:

Privacy Friendly Apps

In this area, students complete an app (or an extension of an app) among our Privacy-Friendly Apps. Please click the following link to know more about them: https://secuso.aifb.kit.edu/english/105.php . Students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

Title: NoPhish App Rework
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Designing Security User studies

These topics are related to how to set up and conduct user studies of various types. Online studies, interviews and lab studies are possible. At the end of the semester, the students present a report / paper and a talk in which they present their methodologies and the results of small pre-studies.

Title: Usability of Password Managers in Virtual Reality
Number of students: 2 Ma
Description: The pre-dominant form of authentication in Virtual Reality (VR) are passwords. Passwords create a burden for users in the VR environment because of special input methods and the virtual keyboard [Stephenson, S. et al (2022). SoK: Authentication in Augmented and Virtual Reality]. Password Managers (PMs) can support the user with handling this problem [Mayer, P. et al. (2022). Why Users (Don't) Use Password Managers at a Large Educational Institution]. They offer auto-filling features, store credentials in an overview or generate complex and secure passwords. Especially in the VR context, where typing a password is slow and complex, PMs can be beneficial. We want to explore the different PMs in VR and test the usability to find challenges and possible solutions.

Title: IT-Security and Privacy Studies in the health sector
Number of students: 1 Ba/Ma
Description: Cyberattacks in the healthcare sector are on the rise and medical facilities are increasingly becoming the target of hacker attacks. This often affects sensitive patient data or, in the event of a cyberattack, patient care. The German Federal Office for Information Security (BSI) reports that “[t]he security situation of the IT infrastructure of medical practices in Germany [...] has hardly been studied to date.” The aim of the work is to find out which scientific studies already exist in the field of IT security and privacy and which best practices can be derived from these studies, e.g. on the subject of recruitment, study design or consideration of special needs.

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Number of students: 1 Ba/Ma
Description: Privacy and Security Awareness in Data Handling: The key issue is that many sports science students may not fully understand the privacy and security risks involved in handling sensitive data. As students increasingly deal with personal and research-related information, gaps in their awareness of data protection, such as risks of data breaches or misuse, can lead to significant vulnerabilities. The aim of the task is to design a survey that assesses their current understanding of these risks, helping to identify areas where further education or guidance is needed.

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These topics are related to run and analyze the results of user-studies. Online studies, interviews and lab studies are all possible, depending on the topic. At the end of the semester, the students present a report / paper with the analyses conducted and a talk in which they present the results.

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Number of students: 1 Ba/Ma
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Number of students: 1 Ba/Ma
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Title: How do website owners become aware that their website was hacked?
Number of students: 1 Ba/Ma
Description: We identified website owners that were affected by a hack on their website and sent them a notification. During the course of the notification process, we also identified several websites who seemingly remediated the hack before our notification. We now wanted to find out, how those website owners got aware of the hack. If they were notified by a third party, we would also like to know how and by whom they were notified and what their feelings were with respect to the notification.

Title: Cognitive Walkthrough for applying, installing, and using an S/MIME certificate at KIT
Number of students: 1-2 Ba/Ma
Description: The main application of S/MIME is the encryption and signing of e-mail messages. The KIT offers all members the opportunity to have S/MIME certificates issued and has recently started using a new process of the European research network GÉANT for this purpose. The aim of this work is to carry out a cognitive walkthrough with members of the KIT to apply for, set up and use S/MIME certificates and to identify problem areas and obstacles.

This event counts towards the KASTEL certificate. Further information on how to obtain the certificate can be found on the SECUSO website https://secuso.aifb.kit.edu/Studium_und_Lehre.php) .

V Practical lab Security, Usability and Society (Bachelor)

2512554, SS 2025, 3 SWS, Language: English, Open in study portal

Practical course (P)
Blended (On-Site/Online)

Content
In the lab-course “Security, Usability and Society”, students deal with practical and interdisciplinary topics from the field of IT security and privacy at the cutting edge of society. In addition to the programming of data-saving apps, the development or implementation of user studies can also be possible tasks in this course.

The course can be credited towards the KASTEL certificate. Further information about the KASTEL certificate can be found on the SECUSO website: https://secuso.aifb.kit.edu/Studium_und_Lehre.php

Prerequisites:

The internship is aimed at Bachelor's and Master's students from the Industrial Engineering and Management, Business Informatics and Computer Science degree programs as well as related degree programs.

Organization:

There are two mandatory attendance dates: The kick-off is scheduled for the first week of the lectures, and the final presentations will take place in the second to last week of lectures. Additional dates will be arranged individually with the supervisors. All in-person lectures will be held in English. The main components of the course is the work on the respective topic, a final presentation and a final report. After consultation with the supervisor, all components can be either completed in German or English.

If you have any questions about the course or the registration, please contact contact@secuso.org.

Registration:

The topics for the course as well as the registration is organized via the WiWi-Portal. To reserve a place and choose a topic, students register for the course in the WiWi-Portal. A description of the current topics as well as important dates and deadlines can also be found there.

Please note that the number of topics is limited and topics are allocated in the order of registration.

V

Praktikum Security, Usability and Society (Master)

2512555, SS 2025, 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 5.4 Course: Advanced Topics in Economic Theory [T-WIWI-102609]

Responsible: Prof. Dr. Johannes Brumm
Prof. Dr. Kay Mitusch
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101501 - Economic Theory

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Irregular	1

Events					
ST 2025	2520527	Advanced Topics in Economic Theory	2 SWS	Lecture / 🗣	Mitusch, Brumm
ST 2025	2520528	Übung zu Advanced Topics in Economic Theory	1 SWS	Practice / 🗣	Pegorari, Corbo, Mitusch, Brumm

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Recommendation
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.

Below you will find excerpts from events related to this course:

V Advanced Topics in Economic Theory

2520527, SS 2025, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Literature
Die Veranstaltung wird in englischer Sprache angeboten:

The course is based on the excellent textbook "Microeconomic Theory" (Chapters 1-5, 10, 13-20) by A.Mas-Colell, M.D.Whinston, and J.R.Green.

T 5.5 Course: Algorithms for Planar Graphs [T-INFO-101986]

Responsible: Dr. rer. nat. Torsten Ueckerdt
Organisation: KIT Department of Informatics
Part of: M-INFO-101220 - Algorithms for Planar Graphs

Type	Credits	Grading scale	Recurrence	Version
Oral examination	5	Grade to a third	Each summer term	1

Exams			
WT 24/25	7500227	Algorithms for Planar Graphs	Ueckerdt

T 5.6 Course: Algorithms I [T-INFO-100001]

Responsible: TT-Prof. Dr. Thomas Bläsius
Organisation: KIT Department of Informatics
Part of: M-INFO-100030 - Algorithms I

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

Events					
ST 2025	24500	Algorithms I	4 SWS	Lecture / Practice (/ 🗣	Sanders, Uhl, Seemaier, Lehmann, Hübner, Schimek, Laupichler
Exams					
WT 24/25	7500117	Algorithms I			Bläsius

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.7 Course: Algorithms II [T-INFO-114225]

Responsible: Prof. Dr. Peter Sanders
Organisation: KIT Department of Informatics
Part of: M-INFO-107201 - Algorithms II

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each winter term	1

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

Prerequisites
None.

T 5.8 Course: Analysis of Multivariate Data [T-WIWI-103063]

Responsible: Prof. Dr. Oliver Grothe
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-105414 - Statistics and Econometrics II
M-WIWI-101599 - Statistics and Econometrics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Irregular	1

Events					
ST 2025	2550550		2 SWS	Lecture / 🗣	Grothe
ST 2025	2550551		2 SWS	Practice / 🗣	Grothe, Liu
Exams					
WT 24/25	7900297	Analysis of Multivariate Data			Grothe
ST 2025	7900033	Analysis of Multivariate Data			Grothe

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Recommendation
Attendance of the courses Statistics 1 [2600008] and Statistics 2 [2610020] is recommended.

Annotation
The lecture is not offered regularly. The courses planned for three years in advance can be found online.

Workload
135 hours

Below you will find excerpts from events related to this course:

V 2550550, SS 2025, 2 SWS, Open in study portal — **Lecture (V) On-Site**

Literature
Skript zur Vorlesung

T 5.9 Course: Applied Informatics – Applications of Artificial Intelligence [T-WIWI-110340]

Responsible: Dr.-Ing. Tobias Käfer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101438 - Semantic Knowledge Management

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	2

Events					
WT 24/25	2511314	Applied Informatics - Applications of Artificial Intelligence	2 SWS	Lecture /	Käfer, Kinder
WT 24/25	2511315	Exercises to Applied Informatics - Applications of Artificial Intelligence	1 SWS	Practice /	Käfer, Qu , Kinder
Exams					
WT 24/25	79AIFB_AKI_C1	Applied Informatics – Applications of Artificial Intelligence			Käfer
ST 2025	79AIFB_AKI_C1	Applied Informatics - Applications of AI (Registration until 21.07.2025)			Käfer

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

Competence Certificate
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.

Recommendation
Basics in logic, e.g. from lecture Foundations of Informatics 1 are important.

Workload
135 hours

Below you will find excerpts from events related to this course:

V **Applied Informatics - Applications of Artificial Intelligence** — **Lecture (V)**
2511314, WS 24/25, 2 SWS, Language: German, Open in study portal — **Blended (On-Site/Online)**

Content
The lecture provides insights into the fundamentals of artificial intelligence. Basic methods of artificial intelligence and their applications in industry are presented.

Applications of the AI is a sub-area of computer science dealing with the automation of intelligent behavior. In general, it is a question of mapping human intelligence. Methods of artificial intelligence are presented in various areas such as, for example, question answering systems, speech recognition and image recognition.

The lecture gives an introduction to the basic concepts of artificial intelligence. Essential theoretical foundations, methods and their applications are presented and explained.

This lecture aims to provide students with a basic knowledge and understanding of the structure, analysis and application of selected methods and technologies on artificial intelligence. The topics include, among others, knowledge modeling, machine learning, text mining, uninformed search, and intelligent agents.

Learning objectives:

The students

- consider current research topics in the field of artificial intelligence and in particular learn about the topics of knowledge modeling, machine learning, text mining and uninformed search.
- interdisciplinary thinking.
- technological approaches to current problems.

Workload:

- The total workload for this course is approximately 135 hours
- Time of presentness: 45 hours
- Time of preperation and postprocessing: 60 hours
- Exam and exam preperation: 30 hours

V **Exercises to Applied Informatics - Applications of Artificial Intelligence** **Practice (Ü) On-Site**
2511315, WS 24/25, 1 SWS, Language: German, Open in study portal

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 5.10 Course: Applied Informatics – Cybersecurity [T-WIWI-114156]

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-104069 - Information Security

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2025	2511550	Applied Informatics – Cybersecurity	2 SWS	Lecture / 🗣	Volkamer
ST 2025	2511551	Exercise Applied Informatics – Cybersecurity	1 SWS	Practice / 🗣	Volkamer, Berens, Ballreich
Exams					
ST 2025	79AIFB_CS_A1	Applied Informatics – Cybersecurity (Registration until 21.07.2025)			Volkamer

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

Competence Certificate
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.

Annotation
Competence Goal

The student

- can explain and apply the basics of information security
- knows appropriate measures to achieve different protection goals and can implement these measures
- can assess the quality of organizational protective measures, i.e. among other things
- knows what has to be taken intoaccount when using the individual measures
- understands the differences between information security in the enterprise and in the private context
- knows the areas of application of a variety of relevant standards and knows their weaknesses
- knows and can explain the problems of information security which may arise from human-machine interaction
- can assess messages about detected security problems in a critical way
- can structure a software project in the field of information security and explain and present results in oral and written form
- can use the techniques of Human Centred Security and Privacy by Design to create user-friendly software.

Content

- Basics and concepts of information security
- Understanding the protection objectives of information security and various attack models (including associated assumptions)
- introduction of measures to achieve the respective protection goals, taking into account different attack models
- Note: In contrast to the IT Security lecture, measures such as encryption algorithms are treated only abstractly, i.e. the idea of the measure, assumptions to the attacker and the deployment environment.
- Presentation and analysis of problems of information security arising from human-machine interaction and presentation of the Human Centered Security by Design approach.
- Introduction into organizational protective measures and standards to be observed for companies.

Workload
135 hours

Below you will find excerpts from events related to this course:

V Applied Informatics – Cybersecurity

2511550, SS 2025, 2 SWS, Open in study portal

Lecture (V)
On-Site

Content

- Basics and concepts of information security
- Understanding the protection objectives of information security and various attack models (including associated assumptions)
- introduction of measures to achieve the respective protection goals, taking into account different attack models
- Note: In contrast to the IT Security lecture, measures such as encryption algorithms are treated only abstractly, i. e. the idea of the measure, assumptions to the attacker and the deployment environment.
- Presentation and analysis of problems of information security arising from human-machine interaction and presentation of the Human Centered Security by Design approach.
- Introduction into organisational protective measures and standards to be observed for companies

Learing objectives:

The student

- can explain the basics of information security
- knows suitable measures to achieve different protection goals
- can assess the quality of organisational protective measures, i. e. among other things knows what has to be taken into account when using the individual measures
- understands the differences between information security in the organisational and in the private context
- knows the areas of application of different standards and knows their weaknesses
- knows and can explain the problems of information security that which arise from human-machine interaction
- is able to deal with messages concerning found security problems in a critical way.

This course can also be credited for the KASTEL certificate. Further information about obtaining the certificate can be found on the SECUSO website https://secuso.aifb.kit.edu/Studium_und_Lehre.php).

Literature

- P. Gerber, M. Ghiglieri, B. Henhapl, O. Kulyk, K. Marky, P. Mayer, B. Reinheimer, and M. Volkamer, *Human Factors in Security*. Springer, Jan. 2018, pp. 83–98.
- C. Eckert, *IT-Sicherheit: Konzepte-Verfahren-Protokolle*. Walter de Gruyter, 2013

V

Exercise Applied Informatics – Cybersecurity

2511551, SS 2025, 1 SWS, 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 5.11 Course: Applied Informatics – Modelling [T-WIWI-110338]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101430 - Applied Informatics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each winter term	2

Events					
WT 24/25	2511030	Applied Informatics - Modelling	2 SWS	Lecture / 🗣	Schiefer, Schüler
WT 24/25	2511031	Exercises to Applied Informatics - Modelling	1 SWS	Practice / 🗣	Schiefer, Schüler
Exams					
WT 24/25	79AIFB_AI1_C4	Applied Informatics – Modelling			Oberweis
ST 2025	79AIFB_AI1	Applied Informatics - Modelling (Registration until 21 July 2025)			Oberweis

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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 events related to this course:

V **Applied Informatics - Modelling** — **Lecture (V) On-Site**
2511030, WS 24/25, 2 SWS, Language: German, Open in study portal

Content
In the context of complex information systems, modelling is of central importance, e.g. – in the context of systems to be developed – for a better understanding of their functionality or in the context of existing systems for supporting maintenance and further development.

Modelling, in particular modelling of information systems, forms the core part of this lecture. The lecture is organized in two parts. The first part mainly covers the modelling of static aspectes, the second part covers the modelling of dynamic aspects of information systems.

The lecture sets out with a definition of modelling and the advantages of modelling. After that, advanced aspects of UML, the Entity Relationship model (ER model) and logics as a means of modelling static aspects will be explained. This will be complemented by the relational data model and the systematic design of databases based on ER models. For modelling dynamic aspects, different types of petri-nets together with their respective analysis techniques will be introduced.

Learning objectives:

Students

- explain the strengths and weaknesses of various modeling approachesfor Information Systems and choose an appropriate method for a given problem,
- create UML models, ER models and Petri nets for given problems,
- modelling given situations in propositional and predicate logic and can interpret them,
- analyze various properties in propositional and predicate logic,
- create and evaluate a relational database schema and express queries in relational algebra.

Workload:

- Total effort: 120-135 hours
- Presence time: 45 hours
- Self study: 75-90 hours

Literature

- Bernhard Rumpe. Modellierung mit UML, Springer-Verlag, 2004.
- R. Elmasri, S. B. Navathe. Fundamentals of Database Systems. Pearson Education 2009.
- W. Reisig. Petrinetze, Springer-Verlag, 2010.

Weiterführende Literatur:

- U. Kastens, H. Kleine Büning. Modellierung – Grundlagen und Formale Methoden. Carl Hanser Verlag, 2014
- J.L. Peterson. Petri Net Theory and Modeling of Systems, Prentice Hall, 1981.
- U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag, 2000

V

Exercises to Applied Informatics - Modelling

2511031, WS 24/25, 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 aspectes, the second part covers the modelling of dynamic aspects of information systems.

The lecture sets out with a definition of modelling and the advantages of modelling. After that, advanced aspects of UML, the Entity Relationship model (ER model) and logics as a means of modelling static aspects will be explained. This will be complemented by the relational data model and the systematic design of databases based on ER models. For modelling dynamic aspects, different types of petri-nets together with their respective analysis techniques will be introduced.

Learning objectives:

Students

- explain the strengths and weaknesses of various modeling approachesfor Information Systems and choose an appropriate method for a given problem,
- create UML models, ER models and Petri nets for given problems,
- modelling given situations in propositional and predicate logic and can interpret them,
- analyze various properties in propositional and predicate logic,
- create and evaluate a relational database schema and express queries in relational algebra.

Workload:

- Total effort: 120-135 hours
- Presence time: 45 hours
- Self study: 75-90 hours

Organizational issues
Bei Bedarf wird ein Tutorium online angeboten.

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 5.12 Course: Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services [T-WIWI-110339]

Responsible: Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101430 - Applied Informatics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	see Annotations	2

Events					
ST 2025	2511032	Applied Informatics - Internet Computing	2 SWS	Lecture / 🗣	Lins, Kannengießer, Schmidt-Kraepelin, Sturm, Thiebes
ST 2025	2511033	Übungen zu Angewandte Informatik - Internet Computing	1 SWS	Practice / 🏵	Lins, Kannengießer, Schmidt-Kraepelin, Sturm, Thiebes, Guse, Rank
Exams					
WT 24/25	79AIFB_AI-IC_B4	Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services			Sunyaev
ST 2025	79AIFB_AI2	Applied Informatics - Internet Computing (Registration until 16.09.2025)			Sunyaev

Legend: 📱 Online, 🏵 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The examination will be offered for the last time in the summer semester 2025 for first-time students. The last examination opportunity (only for repeaters) is in the winter semester 2025/2026. The lecture"Applied Computer Science - Internet Computing" (Prof. Dr. A. Sunyaev) will be replaced by the new lecture "Applied Computer Science - Cybersecurity" (Prof. Dr. M. Volkamer).

Success is assessed in the form of a written examination (60 minutes) in accordance with §4(2),1 SPO.

Successful completion of the exercises is recommended for the written exam, which is offered at the end of the winter semester and at the end of the summer semester.

A grade bonus can be earned for successful participation in the exercises by submitting correct solutions to 50% of the 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

Recommendation
Previous knowledge from the modules Basic Concepts of Informatics and Algorithms I is strongly recommended.

Annotation
The lecture "Applied Computer Science - Internet Computing" (Prof. Dr. A. Sunyaev) will be held for the last time in the summer semester 2025 and will then be replaced by the new lecture "Applied Computer Science - Cyber Security" (Prof. Dr. M. Volkamer).

Workload
135 hours

Below you will find excerpts from events related to this course:

V **Applied Informatics - Internet Computing** — **Lecture (V) On-Site**
2511032, SS 2025, 2 SWS, Language: German, Open in study portal

Content
The lecture Applied Computer Science - Internet Computing provides insights into fundamental concepts and future technologies of distributed systems and Internet computing. Students should be able to select, design and apply the presented concepts and technologies. The course first introduces basic concepts of distributed systems (e.g. design of architectures for distributed systems, internet architectures, web services, middleware).

In the second part of the course, emerging technologies of Internet computing will be examined in depth. These include, among others:

- Cloud Computing
- Edge & Fog Computing
- Internet of Things
- Blockchain
- Artificial Intelligence

Learning objectives:

The student learns about basic concepts and emerging technologies of distributed systems and internet computing. Practical topics will be deepened in lab classes.

Recommendations:

Knowledge of content of the module [WI1INFO].

Workload:

The total workload for this course is approximately 135-150 hours.

Literature
Wird in der Vorlesung bekannt gegeben

T 5.13 Course: Auction & Mechanism Design [T-WIWI-102876]

Responsible: Prof. Dr. Nora Szech
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101499 - Applied Microeconomics
M-WIWI-101501 - Economic Theory

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2025	2560550	Digitale Märkte und Mechanismen	2 SWS	Lecture / 🗣	Rosar
ST 2025	2560551	Übung zu Digitale Märkte und Mechanismen	1 SWS	Practice / 🗣	Rosar
Exams					
WT 24/25	7900007	Exam Digitale Märkte und Mechanismen (2)			Puppe
ST 2025	7900161	Exam Digitale Märkte und Mechanismen			Puppe

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

A bonus can be earned through successful participation in the excercise. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the course.

Prerequisites
None

Recommendation
Basic knowledge of microeconomics and statistics are recommended. A background in game theory is helpful, but not absolutely necessary.

Annotation
The lecture will be held in English.

T 5.14 Course: B2B Sales Management [T-WIWI-111367]

Responsible: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101424 - Foundations of Marketing

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2572187	B2B Sales Management	2 SWS	Lecture / 🗣	Klarmann
WT 24/25	2572188	Excercises B2B Sales Management	1 SWS	Practice / 🗣	Gerlach, Daumann
Exams					
WT 24/25	7900125	B2B Sales Management			Klarmann
ST 2025	7900021	B2B Sales Management			Klarmann

Legend: 💻 Online, 🖧 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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.

Annotation
For further information, please contact Marketing and Sales Research Group (marketing.iism.kit.edu).

Workload
135 hours

Below you will find excerpts from events related to this course:

V **B2B Sales Management** — **Lecture (V) On-Site**
2572187, WS 24/25, 2 SWS, Language: German, Open in study portal

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 5.15 Course: Bachelor's Thesis [T-INFO-109907]

Organisation: KIT Department of Informatics
Part of: M-INFO-104875 - Module Bachelor's Thesis

Type	Credits	Grading scale	Recurrence	Version
Final Thesis	15	Grade to a third	Each term	1

Final Thesis
This course represents a final thesis. The following periods have been supplied:

Submission deadline	4 months
Maximum extension period	1 months
Correction period	6 weeks

T 5.16 Course: Basic Notions of Computer Science [T-INFO-101964]

Responsible: 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 scale	Recurrence	Version
Written examination	6	Grade to a third	Each winter term	1

Events					
WT 24/25	2424001	Grundbegriffe der Informatik	3 SWS	Lecture / 🗣	Ueckerdt
Exams					
WT 24/25	75400100	Basic Notions of Computer Science			Ueckerdt

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.17 Course: Basic Notions of Computer Science Pass [T-INFO-101965]

Responsible: 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 scale	Recurrence	Version
Completed coursework	0	pass/fail	Each winter term	1

Events					
WT 24/25	2424002	Übungen zu Grundbegriffe der Informatik	1 SWS	Practice / 🗣	Schneider, Ueckerdt, Merker
Exams					
WT 24/25	7500191	Basic Notions of Computer Science I Pass			Ueckerdt

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.18 Course: Basic Practical Course for the ICPC-Programming Contest [T-INFO-101991]

Responsible: 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 scale	Recurrence	Version
Completed coursework	4	pass/fail	Each summer term	2

Events					
ST 2025	24872	Basispraktikum zum ICPC Programmierwettbewerb	6 SWS	Practical course / 🗣	Zündorf, Ueckerdt, Goetze, Bläsius

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.19 Course: Basic Principles of Economic Policy [T-WIWI-103213]

Responsible: Prof. Dr. Ingrid Ott
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101668 - Economic Policy I

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	see Annotations	1

Events					
ST 2025	2560280	Basic Principles of Economic Policy	2 SWS	Lecture / 🗣	Ott
ST 2025	2560281	Exercises of Basic Principles of Economic Policy	1 SWS	Practice / 🗣	Zoroglu, Ghoniem
Exams					
WT 24/25	7900079	Basic Principles of Economic Policy			Ott
ST 2025	7900106	Basic Principles of Economic Policy			Ott

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
Depending on further pandemic developments, the examination will be offered either as a 60-minute written examination (written examination according to SPO § 4 Abs. 2, Pkt. 1) or as an open-book examination (alternative exam assessment according to SPO § 4 Abs. 2, Pkt. 3).

Prerequisites
None

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

Annotation
Please note that the lecture will not be held in summer semester 2021. 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 events related to this course:

V **Basic Principles of Economic Policy** **Lecture (V)**
2560280, SS 2025, 2 SWS, Language: German, Open in study portal **On-Site**

Content
The lecture deals with theories of general economic policy and discussion of current economic policy topics:

- Goals of economic policy,
- Instruments and institutions of economic policy,
- Triad of regional, national and European economic policies,
- special fields of economic policy, in particular growth, employment, provision of public infrastructure and climate policy.

Learning objectives:

Students shall be given the ability to

- apply basic concepts of micro- and macroeconomic theories to economic policy issues
- develop arguments on how state intervention in the market can be legitimized from a welfare economic perspective
- derive theory-based policy recommendations

Recommendations:

Basic micro- and macroeconomic knowledge is required, especially as taught in the courses Economics I [2610012] and Economics II [2600014].

Workload:

Total effort at 4.5 LP is approx. 135 hours and consists of:

- Presence time: approx. 30 hours
- Self-study: approx. 105 hours

Assessment:

The examination takes place in the form of a written examination (60min) (according to §4(2), 1 SPO). The examination is offered every semester and can be repeated at any regular examination date.

Organizational issues
Zugehörige Veranstaltung: Übungen zur Einführung in die Wirtschaftspolitik [2560281]
Vorbereitungsmaterialien finden Sie im Ilias.

Literature

- Klump, Rainer (2013): Wirtschaftspolitik. Pearson Studium
- Baldwin, Richard und Charles Wyplosz (2019): The Economics of European Integration, 6. Edition, McGraw-Hill Education, London
- Foliensatz zur Vorlesung
- Übungsaufgaben

V

Exercises of Basic Principles of Economic Policy

2560281, SS 2025, 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 5.20 Course: Basics of German Company Tax Law and Tax Planning [T-WIWI-108711]

Responsible: Dr. Gerd Gutekunst
Prof. Dr. Berthold Wigger

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101403 - Public Finance
M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	2

Events					
WT 24/25	2560134	Basics of German Company Tax Law and Tax Planning	3 SWS	Lecture / 🗣	Wigger, Gutekunst
Exams					
WT 24/25	790unbe	Basics of German Company Tax Law and Tax Planning			Wigger
ST 2025	790unbe	Basics of German Company Tax Law and Tax Planning			Wigger

Legend: 💻 Online, 🎲 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
Depending on the further pandemic development the assessment will consist either of an open book exam (following Art. 4, para. 2, clause 3 of the examination regulation), or of an 1.5 h written exam (following Art. 4, para. 2, clause 1 of the examination regulation).

Prerequisites
None

Recommendation
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 events related to this course:

V Basics of German Company Tax Law and Tax Planning

2560134, WS 24/25, 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 5.21 Course: Brand Management [T-WIWI-112156]

Responsible: Prof. Dr. Ann-Kristin Kupfer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101424 - Foundations of Marketing

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2572190	Brand Management	2 SWS	Lecture / 🗣	Kupfer
WT 24/25	2572191	Brand Management Exercise	1 SWS	Practice / 🗣	Kupfer
Exams					
WT 24/25	7900158	Brand Management			Kupfer
ST 2025	7900047	Brand Management			Kupfer

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Recommendation
Students are highly encouraged to actively participate in class.

Workload
135 hours

Below you will find excerpts from events related to this course:

V Brand Management

2572190, WS 24/25, 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 5.22 Course: Business Process Modelling [T-WIWI-102697]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101476 - Business Processes and Information Systems
M-WIWI-101438 - Semantic Knowledge Management

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	2

Events					
WT 24/25	2511210	Business Process Modelling	2 SWS	Lecture / 🗣	Oberweis
WT 24/25	2511211	Exercise Business Process Modelling	1 SWS	Practice / 🗣	Oberweis, Schüler
Exams					
WT 24/25	79AIFB_MvG_C2	Business Process Modelling			Oberweis
ST 2025	79AIFB_MvG_B4	Business Process Modelling (Registration until 21.07.2025)			Oberweis

Legend: 🖥 Online, 🖧 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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 events related to this course:

V Business Process Modelling

2511210, WS 24/25, 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 aplly 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 modells 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 5.23 Course: Business Strategies of Banks [T-WIWI-102626]

Responsible: Prof. Dr. Wolfgang Müller
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101423 - Topics in Finance II

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	see Annotations	1

Competence Certificate
The lecture will be offered for the last time in the winter semester 2021/22. The exam will take place for the last time in the summer semester 2022 (only for repeaters).

Prerequisites
None

Recommendation
None

Annotation
The lecture will be offered for the last time in the winter semester 2021/22.

T 5.24 Course: Civil Law for Beginners [T-INFO-103339]

Responsible: Dr. Yvonne Matz
Organisation: KIT Department of Informatics
Part of: M-INFO-101190 - Introduction to Civil Law

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	3

Events					
WT 24/25	2424012	Civil Law for Beginners	4 SWS	Lecture / 🗣	Matz
Exams					
WT 24/25	7500012	Civil Law for Beginners			Matz
ST 2025	7500041	Civil Law for Beginners			Matz

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.25 Course: Competition in Networks [T-WIWI-100005]

Responsible: Prof. Dr. Kay Mitusch
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101668 - Economic Policy I
M-WIWI-101499 - Applied Microeconomics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	3

Events					
WT 24/25	2561204	Competition in Networks	2 SWS	Lecture /	Mitusch
WT 24/25	2561205	Übung zu Wettbewerb in Netzen	1 SWS	Practice /	Mitusch, Corbo
Exams					
WT 24/25	7900221	Competition in Networks			Mitusch

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

Competence Certificate
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.

Recommendation
Basics of microeconomics obtained within the undergraduate programme (B.Sc) of economics are required.

Workload
135 hours

Below you will find excerpts from events related to this course:

V Competition in Networks

2561204, WS 24/25, 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 5.26 Course: Computational Macroeconomics [T-WIWI-112723]

Responsible: Prof. Dr. Johannes Brumm
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-106472 - Advanced Macroeconomics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	2

Events					
ST 2025	2500162	Computational Macroeconomics	2 SWS	Lecture / 🗣	Brumm
ST 2025	2500164	Übung zu Computational Macroeconomics	1 SWS	Practice / 🗣	Hußmann
Exams					
WT 24/25	7900076	Computational Macroeconomics			Brumm

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Annotation
New lecture starting summer semester 2024.

Workload
135 hours

T 5.27 Course: Computational Risk and Asset Management [T-WIWI-102878]

Responsible: Prof. Dr. Maxim Ulrich
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103120 - Financial Economics

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Irregular	5

Competence Certificate
The module examination takes the form of an alternative exam assessment.
The alternative exam assessment consists of a Python-based "Takehome Exam". At the end of the third week of January, the student is given a "Takehome Exam" which he processes and sends back independently within 4 hours using Python. Precise instructions will be announced at the beginning of the course. The alternative exam assessment can be repeated a maximum of once. A timely repeat option takes place at the end of the third week in March of the same year. More detailed instructions will be given at the beginning of the course.

Prerequisites
None.

Recommendation
Basic knowledge of capital markt theory.

Workload
135 hours

T 5.28 Course: Computer Architecture [T-INFO-101355]

Responsible: Prof. Dr. Wolfgang Karl
Organisation: KIT Department of Informatics
Part of: M-INFO-100818 - Computer Architecture

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

Events					
ST 2025	2424570	Computer structures	3 SWS	Lecture / 🗣	Karl
Exams					
WT 24/25	7500034	Computer Architecture			Karl

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.29 Course: Computer Graphics [T-INFO-101393]

Responsible: Prof. Dr.-Ing. Carsten Dachsbacher
Organisation: KIT Department of Informatics
Part of: M-INFO-100856 - Computer Graphics

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each winter term	1

Events					
WT 24/25	2424081	Computergrafik	4 SWS	Lecture / 🗣	Dachsbacher, Alber, Lerzer
Exams					
WT 24/25	7500430	Computer Graphics			Dachsbacher

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.30 Course: Computer Graphics Pass [T-INFO-104313]

Responsible: Prof. Dr.-Ing. Carsten Dachsbacher
Organisation: KIT Department of Informatics
Part of: M-INFO-100856 - Computer Graphics

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each winter term	1

Events					
WT 24/25	2424083	Übungen zu Computergrafik		Lecture / Practice (/ 🗣	Alber, Lerzer, Dachsbacher
Exams					
WT 24/25	7500508	Computer Graphics			Dachsbacher

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.31 Course: Computer Organization [T-INFO-103531]

Responsible: Prof. Dr. Wolfgang Karl
Organisation: KIT Department of Informatics
Part of: M-INFO-103179 - Computer Organization

Type	Credits	Grading scale	Version
Written examination	6	Grade to a third	1

Events					
WT 24/25	2424502	Computer Organization	3 SWS	Lecture	Henkel, Lehmann
WT 24/25	2424505	Übungen zu Rechnerorganisation	2 SWS	Practice	Lehmann
Exams					
WT 24/25	7500228	Computer Organization			Henkel

T 5.32 Course: Consulting in Practice [T-INFO-101975]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-105589 - Introduction to Data and Information Management

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	1,5	pass/fail	Irregular	1

T 5.33 Course: Consumer Psychology [T-WIWI-114292]

Responsible: Prof. Dr. Benjamin Scheibehenne
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101424 - Foundations of Marketing

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each summer term	1

Events					
ST 2025	2572174	Consumer Psychology	3 SWS	Lecture	Scheibehenne
ST 2025	2572176	Übung zu Consumer Psychology	1 SWS	Practice / 🗣	Scheibehenne, Vadakkedath Dharmapalan
Exams					
ST 2025	7900009	Consumer Psychology			Scheibehenne

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment of success takes the form of a presentation (weighting 20%) as part of the exercise and a written examination (90 minutes, weighting 80%).

The point system for the assessment will be announced at the beginning of the course.

Prerequisites
None.

Annotation
For further information, please contact the research group Marketing and Sales (http://marketing.iism.kit.edu/).

Workload
90 hours

Below you will find excerpts from events related to this course:

V Consumer Psychology

2572174, SS 2025, 3 SWS, Language: English, Open in study portal

Lecture (V)

Content

Important information

2. Übung associated with this course is MANDATORY: Students will be asked to do presentations in groups of 3 (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 decided at the beginning of the semester). This task will count towards 20% of the final grades of the "Consumer Behavior" class. There will be no weekly or biweekly Übung besides this event.

Goal

The goal of the class is to gain a better understanding of the situational, biological, cognitive, and evolutionary factors that drive consumer behavior. We will address these questions from an interdisciplinary perspective, including relevant theories and empirical research findings from Psychology, Marketing, Cognitive Science, Biology, and Economics.

Description

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. To help people making better choices it is important to understand the factors that influence their behavior. Towards this goal, 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 lecture will be held in English.

Grading

Grading is based on two parts. An oral presentation that takes place in the Übung will count towards 20% of the grade. A written exam at the last day of class will make the rest 80%. The exam will cover the content of the lecture and the literature listed in the required reading list that will be made available to enrolled students on the first day of 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.

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

Organizational issues

Anmeldung über Campusportal

Literature

Will be made available to enrolled students on the first day of class.

T 5.34 Course: Curves in CAD [T-INFO-102067]

Responsible: Prof. Dr. Hartmut Prautzsch
Organisation: KIT Department of Informatics
Part of: M-INFO-101248 - Curves in CAD

Type	Credits	Grading scale	Recurrence	Version
Oral examination	5	Grade to a third	Irregular	1

T 5.35 Course: Database as a Service [T-INFO-111400]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-105589 - Introduction to Data and Information Management

Type	Credits	Grading scale	Recurrence	Version
Oral examination	5	Grade to a third	Irregular	1

Prerequisites
none

T 5.36 Course: Database Systems [T-INFO-101497]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-104921 - Database Systems

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each summer term	2

Events					
ST 2025	24516	Datenbanksysteme	2 SWS	Lecture / 🗣	Böhm, Reimann
ST 2025	24522	Übungen zu Datenbanksysteme	1 SWS	Practice / 🗣	Böhm, Kalinke, Reimann
Exams					
WT 24/25	7500189	Database Systems			Böhm, Mülle
WT 24/25	7500379	Database Systems			Böhm, Mülle
ST 2025	7500166	Database Systems			Böhm, Neumann

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.37 Course: Deployment of Database Systems [T-INFO-101317]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-105589 - Introduction to Data and Information Management

Type	Credits	Grading scale	Recurrence	Version
Oral examination	5	Grade to a third	Each winter term	1

Events					
WT 24/25	2400111	Datenbankeinsatz	3 SWS	Lecture / 🗣	Böhm, Mülle
Exams					
WT 24/25	7500007	Deployment of Database Systems			Böhm, Mülle
WT 24/25	7500331	Deployment of Database Systems			Böhm
ST 2025	7500090	Deployment of Database Systems			Böhm

Legend: 🖥 Online, 🖧 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.38 Course: Derivatives [T-WIWI-102643]

Responsible: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I
M-WIWI-101402 - eFinance

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2025	2530550	Derivatives	2 SWS	Lecture / 🗣	Uhrig-Homburg, Thimme
ST 2025	2530551	Übung zu Derivate	1 SWS	Practice / 🗣	Dinger, Uhrig-Homburg, Thimme
Exams					
WT 24/25	7900051	Derivatives			Uhrig-Homburg
ST 2025	7900111	Derivatives			Uhrig-Homburg

Legend: 📱 Online, 🎲 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
Depending on further pandemic developments, the examination will be offered either as a 60-minute written examination or as an open-book examination (alternative exam assessment).

A bonus can be earned by correctly solving at least 50% of the posed bonus 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.

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Derivatives

2530550, SS 2025, 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 5.39 Course: Digital Circuits Design [T-INFO-103469]

Responsible: Prof. Dr.-Ing. Uwe Hanebeck
Organisation: KIT Department of Informatics
Part of: M-INFO-102978 - Digital Circuits Design

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

Events					
ST 2025	24007	Digital Circuits Design	3 SWS	Lecture / 🗣	Tahoori
Exams					
WT 24/25	7500254	Digital Circuits Design			Hanebeck

Legend: 📱 Online, 🏘 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.40 Course: Digital Games [T-INFO-112750]

Responsible: Prof. Dr. Kathrin Gerling
Organisation: KIT Department of Informatics
Part of: M-INFO-106291 - Digital Games

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

Events					
ST 2025	2400162	Digital Games	4 SWS	Lecture / Practice (/ 🗣	Gerling, Alexandrovsky
Exams					
WT 24/25	7500375	Digital Games			Gerling
ST 2025	7500055	Digital Games			Gerling

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.41 Course: Digital Games Pass [T-INFO-112751]

Responsible: Prof. Dr. Kathrin Gerling
Organisation: KIT Department of Informatics
Part of: M-INFO-106291 - Digital Games

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each summer term	1

Events					
ST 2025	2400162	Digital Games	4 SWS	Lecture / Practice (/ 🗣	Gerling, Alexandrovsky
Exams					
ST 2025	7500295	Digital Games			Gerling

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.42 Course: Digital Markets and Market Design [T-WIWI-112228]

Responsible: Prof. Dr. Adrian Hillenbrand
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101499 - Applied Microeconomics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2500035	Digital Markets and Market Design	2 SWS	Lecture / 🗣	Hillenbrand
WT 24/25	2500036	Digital Markets and Market Design	1 SWS	Practice / 🗣	Hillenbrand
Exams					
WT 24/25	7900354	Digital Markets and Market Design			Hillenbrand
ST 2025	7900249	Digital Markets and Market Design			Hillenbrand

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment consists of a written exam (60 minutes).
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Annotation
The lecture will be held in English.

Below you will find excerpts from events related to this course:

V Digital Markets and Market Design

2500035, WS 24/25, 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 24/25, 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 5.43 Course: Digital Services: Foundations [T-WIWI-111307]

Responsible: Prof. Dr. Gerhard Satzger
Dr. Michael Vössing

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-102752 - Fundamentals of Digital Service Systems
M-WIWI-101434 - eBusiness and Service Management
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2025	2595466	Digital Services: Foundations	2 SWS	Lecture /	Vössing, Holtmann
ST 2025	2595467	Exercise Digital Services: Foundations	1 SWS	Practice /	Vössing
Exams					
WT 24/25	7900062	Digital Services: Foundations			Satzger
ST 2025	7900165	Digital Services: Foundations			Satzger

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

Competence Certificate
The assessment consists of a written exam (60 min) (§4(2), 1 of the examination regulations).

Annotation
The course will be offered in the form of a flipped classroom concept starting in summer semester 2023. The lecture will be recorded in advance and made available online. During the exercise classes, the contents of the lecture will be discussed and applied as part of programming exercises.

Workload
135 hours

Below you will find excerpts from events related to this course:

V Digital Services: Foundations

2595466, SS 2025, 2 SWS, Language: English, Open in study portal

Lecture (V)
Blended (On-Site/Online)

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) pushes “servitization” and the economic importance of digital services and, therefore, drives competition: Increased interaction and individualization options open up new dimensions of “value co-creation” between providers and customers; dynamic and scalable service value networks replace static value chains; services can instantly be delivered anywhere across the globe.

Building on a systematic categorization of different types of services and on the general notion of “value co-creation”, we cover concepts and foundations for engineering and managing ICT-based digital services, allowing for further specialization in other KSRI/IISM courses at the Master level. Topics in this course include an introduction to services and human-centered design, as well as an introduction to AI-based services, and IoT-based services. Additionally, essential concepts for the design of AI-based services are covered, such as fairness, sustainability, and human-AI collaboration in services. In this context, regulation approaches for novel technologies emerging out of the fast-paced world of digital services are discussed from legislation and industry perspectives. Finally, the lecture lays the practical foundations for implementing, distributing, and managing services at scale. Besides those contents, the lecture entails first-hand research insights, exercises and discussion sessions, and guest lectures that will illustrate the relevance of digital services in today’s world.

Literature

- Beverungen, D., Müller, O., Matzner, M., Mendling, J., & Vom Brocke, J. (2019). Conceptualizing smart service systems. *Electronic Markets*, *29*(1), 7-18.
- Böhmann, T., Leimeister, J. M., & Möslein, K. (2014). Service systems engineering. *Business & Information Systems Engineering*, *6*(2), 73-79.
- Cardoso, J., Fromm, H., Nickel, S., Satzger, G., Studer, R., & Weinhardt, C. (Eds.). (2015). *Fundamentals of service systems* (Vol. 12). Heidelberg: Springer.
- Davenport, T., & Harris, J. (2017). *Competing on analytics: Updated, with a new introduction: The new science of winning*. Harvard Business Press.
- 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.
- Schüritz, R., & Satzger, G. (2016). Patterns of data-infused business model innovation. In *2016 IEEE 18th Conference on Business Informatics (CBI)* (Vol. 1, pp. 133-142). IEEE.
- Spohrer, J., Maglio, P. P., Bailey, J., & Gruhl, D. (2007). Steps toward a science of service systems. *Computer*, *40*(1), 71-77.

T 5.44 Course: Economics and Behavior [T-WIWI-102892]

Responsible: Prof. Dr. Nora Szech
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101499 - Applied Microeconomics
M-WIWI-101501 - Economic Theory

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2560137	Economics and Behavior	2 SWS	Lecture / 🗣	Rau
WT 24/25	2560138	Übung zu Economics and Behavior	1 SWS	Practice / 🗣	Zhao
Exams					
WT 24/25	7900134	Exam Economics and Behavior			Puppe
ST 2025	7900154	Exam Economics and Behavior (2)			Puppe

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Recommendation
Basic knowledge of microeconomics and statistics are recommended. A background in game theory is helpful, but not absolutely necessary.

Annotation
The lecture will be held in English.

Below you will find excerpts from events related to this course:

V Economics and Behavior

2560137, WS 24/25, 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 5.45 Course: Economics I: Microeconomics [T-WIWI-102708]

Responsible: Prof. Dr. Clemens Puppe
Prof. Dr. Johannes Philipp Reiß
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101431 - Economics

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	1

Events					
WT 24/25	2610012	Economics I: Microeconomics	3 SWS	Lecture / 🗣	Reiß, Potarca
WT 24/25	2610013			Tutorial (/ 🗣	Reiß, Potarca
Exams					
WT 24/25	7910001	Economics I: Microeconomics			Reiß
WT 24/25	7910002	Economics I: Microeconomics			Reiß

Legend: 🖥 Online, 🖧 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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 events related to this course:

V Economics I: Microeconomics

2610012, WS 24/25, 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 5.46 Course: Economics III: Introduction in Econometrics [T-WIWI-102736]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101499 - Applied Microeconomics
M-WIWI-101599 - Statistics and Econometrics

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each summer term	2

Events					
ST 2025	2520016	Economics III: Introduction to Econometrics	2 SWS	Lecture / 🗣	Schienle, Bracher
ST 2025	2520017	Übungen zu VWL III	2 SWS	Practice	Schienle, Rüter, Bracher, Leimenstoll
Exams					
WT 24/25	7900002	Economics III: Introduction in Econometrics			Schienle

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
Depending on further pandemic developments, the examination will be offered either as a 90-minute written examination (written examination according to SPO § 4 Abs. 2, Pkt. 1) or as an open-book examination (alternative exam assessment according to SPO § 4 Abs. 2, Pkt. 3).

Prerequisites
None

Below you will find excerpts from events related to this course:

V Economics III: Introduction to Econometrics

2520016, SS 2025, 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 5.47 Course: eFinance: Information Systems for Securities Trading [T-WIWI-110797]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I
M-WIWI-101434 - eBusiness and Service Management
M-WIWI-101402 - eFinance
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2540454	eFinance: Information Systems for Securities Trading	2 SWS	Lecture / 🗣	Weinhardt
WT 24/25	2540455	Übungen zu eFinance: Information Systems for Securities Trading	1 SWS	Practice / 🗣	Motz, Motz
Exams					
WT 24/25	7900182	eFinance: Information Engineering and Management for Securities Trading			Weinhardt
ST 2025	7900269	eFinance: Information Systems for Securities Trading			Weinhardt

Legend: 💻 Online, 🎲 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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.

Annotation
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 events related to this course:

V eFinance: Information Systems for Securities Trading

2540454, WS 24/25, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Literature

- Picot, Arnold, Christine Bortenlänger, Heiner Röhrl (1996): "Börsen im Wandel". Knapp, Frankfurt
- Harris, Larry (2003): "Trading and Exchanges - Market Microstructure for Practitioners"". Oxford University Press, New York

Weiterführende Literatur:

- Gomber, Peter (2000): "Elektronische Handelssysteme - Innovative Konzepte und Technologien". Physika Verlag, Heidelberg
- Schwartz, Robert A., Reto Francioni (2004): "Equity Markets in Action - The Fundamentals of Liquidity, Market Structure and Trading". Wiley, Hoboken, NJ

T 5.48 Course: Energy Policy [T-WIWI-102607]

Responsible: Prof. Dr. Martin Wietschel
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101464 - Energy Economics

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each summer term	3

Events					
ST 2025	2581959	Energy Policy	2 SWS	Lecture / 🗣	Wietschel
Exams					
WT 24/25	7981959	Energy Policy			Fichtner

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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. Depending on the respective pandemic situation, the exam may be offered as an open book exam (alternative exam assessment, following §4(2), 3 of the examination regulation).

Prerequisites
None.

Below you will find excerpts from events related to this course:

V Energy Policy

2581959, SS 2025, 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 5.49 Course: Enterprise Systems for Financial Accounting & Controlling [T-WIWI-113746]

Responsible: Christian Fleig
Prof. Dr. Alexander Mädche

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101434 - eBusiness and Service Management
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2500060	Enterprise Systems for Financial Accounting & Controlling	3 SWS	Lecture / 🗣	Mädche, Fleig
Exams					
WT 24/25	7900074	Enterprise Systems for Financial Accounting & Controlling			Mädche

Legend: 📱 Online, 🎲 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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 events related to this course:

V Enterprise Systems for Financial Accounting & Controlling

2500060, WS 24/25, 3 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content

Enterprise Systems building on enterprise resource planning (ERP) packaged software such as SAP S/4HANA are information systems that target large-scale integration of business processes and data across a company's functional areas. These systems are crucial for financial accounting and controlling as they enable organizations to streamline and integrate their financial operations, ensuring accurate decision-making based on real-time financial data. Contemporary packaged ERP software provide modules that integrate core business processes in financial accounting including general ledger, accounts receivable, payable and asset accounting. The information generated in these processes serves as a major source of cost-related decision-making, reporting and data analyses in internal accounting ("controlling"). Packaged ERP software typically rely on industry best practices captured in the form of product software with a standardized structure of master data. Thereby, they also support regulatory compliance and analyzability of processes in approaches such as process mining which enhances overall business efficiency and competitiveness. However, implementing enterprise systems in practice imposes substantial challenges to organizations.

First, the B.Sc. lecture "Enterprise Systems for Financial Accounting & Controlling" introduces fundamental business processes and concepts in finance and controlling and explains how these processes are implemented in packaged ERP software such as SAP S/4HANA. Students learn the basic and most important terms and master data structures in the SAP FI/CO module. Second, students learn about the principles of packaged ERP software, gaining hands-on experience SAP S4/HANA. Third, the lecture introduces the challenges in enterprise system projects such as SAP S/4HANA implementations, Fourth, students actively apply their knowledge in collaborative team efforts when working with exemplary SAP data in Microsoft SQL Server to analyze finance and controlling master data processes (capstone project)

Learning Objectives:

The students …

- understand modern business concepts of financial accounting & controlling for large enterprises
- the importance of enterprise systems supporting the implemention of modern business concepts
- know the underlying principles of packaged software for enterprise resource planning and process intelligence
- Understand the opportunities and challenges of Enterprise Systems implementation at large enterprises
- Get hands-on knowledge about financial accounting & controlling with commercial product software (e.g., SAP S4/HANA)
- Apply their knowledge on enterprise systems implementation for financial accounting and controlling on real-world data in team effort

T 5.50 Course: Exercises in Civil Law [T-INFO-102013]

Responsible: Dr. Yvonne Matz
Organisation: KIT Department of Informatics
Part of: M-INFO-101191 - Commercial Law

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	9	Grade to a third	Each term	3

Events					
WT 24/25	2424011	Commercial and Corporate Law	2 SWS	Lecture / 🗣	Danek
WT 24/25	2424017	Exercises in Civil Law	2 SWS	Lecture / 🗣	Sattler
ST 2025	24504	Advanced Civil Law	2 SWS	Lecture / 🗣	Matz
ST 2025	24506	Exercises in Civil Law	2 SWS	Lecture / 🗣	Sattler, Bosbach
ST 2025	24926	Case Studies in Civil Law	2 SWS	Practice / 🗣	Bosbach
Exams					
WT 24/25	7500108	Commercial Law			Sattler
ST 2025	7500093	Wirtschaftsprivatrecht			Sattler

Legend: 💻 Online, 🎲 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.51 Course: Facility Location and Strategic Supply Chain Management [T-WIWI-102704]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101421 - Supply Chain Management
M-WIWI-101413 - Applications of Operations Research
M-WIWI-101936 - Methodical Foundations of OR

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	4

Events					
WT 24/25	2550486	Facility Location and Strategic Supply Chain Management	2 SWS	Lecture / 🗣	Nickel
WT 24/25	2550487	Exercises for Facility Location and Strategic Supply Chain Management	1 SWS	Practice / 🗣	Hoffmann
Exams					
WT 24/25	7900091	Facility Location and Strategic Supply Chain Management			Nickel

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

Competence Certificate
The assessment consists of a written exam (60 min) according to Section 4 (2), 1 of the examination regulation.
The exam takes place in every semester.
Prerequisite for admission to examination is the succesful completion of the online assessments.

Prerequisites
Prerequisite for admission to examination is the succesful completion of the online assessments.

Recommendation
None

Annotation
The lecture is held in every winter term. The planned lectures and courses for the next three years are announced online.

Below you will find excerpts from events related to this course:

V Facility Location and Strategic Supply Chain Management

2550486, WS 24/25, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Organizational issues
Für die Klausurzulassung müssen 4 von 5 Online-Tests bestanden sein.

Die Zulassung ist ein Jahr gültig, außer es handelt sich um einen Zweitversuch. In diesem Falle müssen die Online-Tests nicht erneut absolviert werden.

Literature
Weiterführende Literatur:

- Daskin: Network and Discrete Location: Models, Algorithms, and Applications, Wiley, 1995
- Domschke, Drexl: Logistik: Standorte, 4. Auflage, Oldenbourg, 1996
- Francis, McGinnis, White: Facility Layout and Location: An Analytical Approach, 2nd Edition, Prentice Hall, 1992
- Love, Morris, Wesolowsky: Facilities Location: Models and Methods, North Holland, 1988
- Thonemann: Operations Management - Konzepte, Methoden und Anwendungen, Pearson Studium, 2005

T 5.52 Course: Financial Accounting for Global Firms [T-WIWI-107505]

Responsible: Dr. Torsten Luedecke
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2530242	Financial Accounting for Global Firms	2 SWS	Lecture / 🗣	Luedecke
WT 24/25	2530243	Übung zu Financial Accounting for Global Firms	1 SWS	Practice / 🗣	Luedecke
Exams					
WT 24/25	7900142	Financial Accounting for Global Firms			Luedecke, Ruckes
ST 2025	7900195	Financial Accounting for Global Firms			Luedecke

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Prerequisites
None

Recommendation
Basic knowledge in corporate finance and accounting.

Annotation
New lecture in the winter term 2017/18.

Workload
135 hours

Below you will find excerpts from events related to this course:

V Financial Accounting for Global Firms

Lecture (V)
On-Site

2530242, WS 24/25, 2 SWS, Language: English, Open in study portal

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 5.53 Course: Financial Data Science [T-WIWI-111238]

Responsible: Prof. Dr. Maxim Ulrich
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-105610 - Financial Data Science

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	9	Grade to a third	Each summer term	2

Competence Certificate
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 5.54 Course: Financial Econometrics [T-WIWI-103064]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-105414 - Statistics and Econometrics II
M-WIWI-101599 - Statistics and Econometrics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	2

Events					
WT 24/25	2520022	Financial Econometrics I	2 SWS	Lecture / 🗣	Schienle, Buse
WT 24/25	2520023	Übungen zu Financial Econometrics I	2 SWS	Practice / 🗣	Schienle, Buse
Exams					
WT 24/25	7900123	Financial Econometrics II			Schienle
WT 24/25	7900126	Financial Econometrics			Schienle
ST 2025	7900223	Financial Econometrics			Schienle

Legend: 🖥 Online, 🎲 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites
None

Recommendation
Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics"[2520016]

Annotation
The next lecture will take place in the winter semester 2022/23.

Below you will find excerpts from events related to this course:

V Financial Econometrics I

2520022, WS 24/25, 2 SWS, Language: English, Open in study portal

Lecture (V)
On-Site

Content
Learning objectives:

The student

- shows a broad knowledge of fincancial econometric estimation and testing techniques
- is able to apply his/her technical knowledge using software in order to critically assess empirical problems

Content:

ARMA, ARIMA, ARFIMA, (non)stationarity, causality, cointegration, ARCH/GARCH, stochastic volatility models, computer based exercises

Requirements:

It is recommended to attend the course *Economics III: Introduction to Econometrics* [2520016] prior to this course.

Workload:

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

Exam preparation: 40 hours

Literature

Taylor, S. J. (2005): "Asset Price Dynamics, Volatility, and Prediction", Princeton University Press.

Tsay, R. S. (2005): "Analysis of Financial Time Series: Financial Econometrics", Wiley, 2nd edition.

Cochrane, J. H. (2005): "Asset Pricing", revised edition, Princeton University Press.

Campbell, J. Y., A. W. Lo, and A. C. MacKinlay (1997): "The Econometrics of Financial Markets", Princeton University Press.

Hamilton, J. D. (1994): "Time Series Analysis", Princeton University Press.

Additional literature will be discussed in the lecture.

T 5.55 Course: Financial Econometrics II [T-WIWI-110939]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-105414 - Statistics and Econometrics II
M-WIWI-101599 - Statistics and Econometrics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	3

Events					
ST 2025	2521302	Financial Econometrics II	2 SWS	Lecture / 🗣	Schienle, Buse
ST 2025	2521303	Übung zu Financial Econometrics II	1 SWS	Practice / 🗣	Buse, Schienle
Exams					
ST 2025	7900081	Financial Econometrics II			Schienle

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
Written examination (90 minutes). If the number of participants is low, an oral examination will be held instead.

Prerequisites
None

Recommendation
Knowledge of the contents covered by the course "Financial Econometrics"

Annotation
Course language is English
The next lecture will take place in the summer semester of 2023.

Workload
135 hours

T 5.56 Course: Financial Intermediation [T-WIWI-102623]

Responsible: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2530232	Financial Intermediation	2 SWS	Lecture / 🗣	Ruckes
WT 24/25	2530233	Übung zu Finanzintermediation	1 SWS	Practice	Ruckes, Benz
Exams					
WT 24/25	7900063	Financial Intermediation			Ruckes
ST 2025	7900078	Financial Intermediation			Ruckes

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Recommendation
None

Below you will find excerpts from events related to this course:

V Financial Intermediation

2530232, WS 24/25, 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 5.57 Course: Financial Management [T-WIWI-102605]

Responsible: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101435 - Essentials of Finance

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2025	2530216	Financial Management	2 SWS	Lecture / 🗣	Ruckes
ST 2025	2530217	Übung zu Financial Management	1 SWS	Practice / 🗣	Ruckes
Exams					
WT 24/25	7900060	Financial Management			Ruckes
ST 2025	7900074	Financial Management			Ruckes

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Recommendation
Knowledge of the content of the course Business Administration: Finance and Accounting [25026/25027] is recommended.

Below you will find excerpts from events related to this course:

V **Financial Management**
2530216, SS 2025, 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 5.58 Course: FinTech [T-WIWI-112694]

Responsible: TT-Prof. Dr. Julian Thimme
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I
M-WIWI-101402 - eFinance

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2500032	FinTech	3 SWS	Lecture / Practice (/	Thimme
Exams					
WT 24/25	7900064	FinTech			Thimme
ST 2025	7900089	FinTech			Thimme

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

Competence Certificate
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

Recommendation
Knowledge of the course Business Administration: Finance and Accounting [25026/25027] is very helpful.

Workload
135 hours

T 5.59 Course: Formal Systems [T-INFO-101336]

Responsible: Prof. Dr. Bernhard Beckert
Organisation: KIT Department of Informatics
Part of: M-INFO-100799 - Formal Systems

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each winter term	1

Events					
WT 24/25	2424086	Formale Systeme	4 SWS	Lecture / Practice (	Beckert, Ulbrich, Weigl
Exams					
WT 24/25	7500036	Formal Systems			Beckert
ST 2025	7500009	Formal Systems			Beckert

T 5.60 Course: Foundations of Interactive Systems [T-WIWI-109816]

Responsible: Prof. Dr. Alexander Mädche
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-105928 - HR Management & Digital Workplace
M-WIWI-102752 - Fundamentals of Digital Service Systems
M-WIWI-101434 - eBusiness and Service Management
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each summer term	3

Events					
ST 2025	2540560	Foundations of Interactive Systems	3 SWS	Lecture /	Mädche, Feick
Exams					
WT 24/25	7900326	Foundations of Interactive Systems			Mädche

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

Competence Certificate
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

Recommendation
None

Workload
135 hours

Below you will find excerpts from events related to this course:

V Foundations of Interactive Systems

2540560, SS 2025, 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 asmental models. From a computer perspective, we introduce established interaction technologies as well as contemporary multimodal technologies (e.g. augmented/mixed reality, eye-based interaction, etc.). We also introduce established principles and guidelines for designing user interfaces.. Furthermore, we describe the human-centered design process for interactive systems and supporting techniques & tools (e.g. personas, prototyping, user testing).

With this lecture, students acquire foundational knowledge to successfully **design the interaction between humans and computers** in business and private life. The course is complemented with a **Design Capstone Project**, where students in a team apply design methods & techniques to create an interactive prototype.

Learning Objectives

The students

- have a basic understanding of key conceptual and theoretical foundations of interactive systems from a human and computer perspective
- are aware of important design principles for the design of important classes of interactive systems
- know design processes and techniques for developing interactive systems
- know how to apply the knowledge and skills gathered in the lecture for a real-world problem (as part of design capstone project)

Prerequisites: No specific prerequisites are required for the lecture

Language of instruction: English

Bibliography

Alan Dix, Janet E. Finlay, Gregory D. Abowd, and Russell Beale. 2003. Human-Computer Interaction (3rd Edition). Prentice-Hall, Inc., USA.

Further literature will be made available in the lecture. In case of questions feel free to approach Siu Liu (siu.liu@kit.edu).

Die Erfolgskontrolle erfolgt in Form einer Prüfungsleistung anderer Art (Form) nach § 4 Abs. 2 Nr. 3 SPO. Die Leistungskontrolle erfolgt in Form einer einstündigen Klausur und der Durchführung eines Capstone Projektes. Details zur Ausgestaltung der Erfolgskontrolle werden im Rahmen der Vorlesung bekannt gegeben.

T 5.61 Course: Foundations of Mobile Business [T-WIWI-104679]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101476 - Business Processes and Information Systems

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	see Annotations	4

Exams			
WT 24/25	79AIFB_GMB_A1	Foundations of Mobile Business	Oberweis

Competence Certificate
The examination will be offered for the last time in the summer semester 2025 for first-time writers. The last examination opportunity (only for repeaters) is in the winter semester 2025/2026.

Success is assessed in the form of a written (60 min) or oral examination in accordance with §4(2) of the examination regulations.

Prerequisites
None

Annotation
The lecture will no longer be offered from the summer semester 2025 and parts of the lecture will be integrated into the new course "Applied Computer Science - Mobile Computing".

Workload
135 hours

T 5.62 Course: Fundamentals of Production Management [T-WIWI-102606]

Responsible: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101437 - Industrial Production I

Type	Credits	Grading scale	Recurrence	Version
Written examination	5,5	Grade to a third	Each summer term	1

Events					
ST 2025	2581950	Fundamentals of Production Management	2 SWS	Lecture / 🗣	Schultmann
ST 2025	2581951	Übungen Grundlagen der Produktionswirtschaft	2 SWS	Practice / 🗣	Frank, Fuhg
Exams					
WT 24/25	7981950	Fundamentals of Production Management			Schultmann

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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 events related to this course:

V Fundamentals of Production Management

2581950, SS 2025, 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 5.63 Course: Geometric Basics for Geometry Processing [T-INFO-111453]

Responsible: Prof. Dr. Hartmut Prautzsch
Organisation: KIT Department of Informatics
Part of: M-INFO-105735 - Geometric Basics for Geometry Processing

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each winter term	2

Events					
WT 24/25	2400035	Geometric Concepts for Geometry Processing	2 SWS	Lecture / 🗣	Prautzsch
Exams					
WT 24/25	7500337	Geometric Basics for Geometry Processing			Prautzsch
ST 2025	7500360	Geometric Basics for Geometry Processing			Prautzsch

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.64 Course: Global Optimization I [T-WIWI-102726]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101413 - Applications of Operations Research
M-WIWI-101936 - Methodical Foundations of OR

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2025	2550134	Global Optimization I	2 SWS	Lecture / 🗣	Stein
Exams					
WT 24/25	7900004_WS2425_NK	Global Optimization I			Stein
ST 2025	7900205_SS2025_HK	Global Optimization I			Stein

Legend: 💻 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
Success is in the form of a written examination (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

Recommendation
None

Annotation
Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from events related to this course:

V **Global Optimization I** — **Lecture (V) On-Site**
2550134, SS 2025, 2 SWS, Language: German, Open in study portal

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, Grundzüge der Globalen Optimierung, SpringerSpektrum, 2018.

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 5.65 Course: Global Optimization I and II [T-WIWI-103638]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101936 - Methodical Foundations of OR

Type	Credits	Grading scale	Recurrence	Version
Written examination	9	Grade to a third	Each summer term	1

Events					
ST 2025	2550134	Global Optimization I	2 SWS	Lecture / 🗣	Stein
ST 2025	2550135	Exercise to Global Optimization I	1 SWS	Practice / 🗣	Stein, Beck
ST 2025	2550136	Global Optimization II	2 SWS	Lecture / 🗣	Stein
Exams					
WT 24/25	7900006_WS2425_NK	Global Optimization I and II			Stein
ST 2025	7900207_SS2025_HK	Global Optimization I and II			Stein

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment of the lecture is a written examination (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

Recommendation
None

Annotation
Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from events related to this course:

V Global Optimization I

2550134, SS 2025, 2 SWS, Language: German, 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, Grundzüge der Globalen Optimierung, SpringerSpektrum, 2018.

Weiterführende Literatur:

- W. Alt, Numerische Verfahren der konvexen, nichtglatten Optimierung, Teubner, 2004
- C.A. Floudas, Deterministic Global Optimization, Kluwer, 2000
- R. Horst, H. Tuy, Global Optimization, Springer, 1996
- A. Neumaier, Interval Methods for Systems of Equations, Cambridge University Press, 1990

V

Global Optimization II

2550136, SS 2025, 2 SWS, Language: German, 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, Grundzüge der Globalen Optimierung, SpringerSpektrum, 2018.

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 5.66 Course: Global Optimization II [T-WIWI-102727]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101936 - Methodical Foundations of OR

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	2

Events					
ST 2025	2550136	Global Optimization II	2 SWS	Lecture / 🗣	Stein
ST 2025	2550137	Exercise to Global Optimization II	1 SWS	Practice / 🗣	Stein, Beck
Exams					
WT 24/25	7900005_WS2425_NK	Global Optimization II			Stein
ST 2025	7900206_SS2025_HK	Global Optimization II			Stein

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment of the lecture is a written examination (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

Annotation
Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from events related to this course:

V Global Optimization II

2550136, SS 2025, 2 SWS, Language: German, 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, Grundzüge der Globalen Optimierung, SpringerSpektrum, 2018.

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 5.67 Course: HR-Management 1: HR Strategies in the Age of AI [T-WIWI-113745]

Responsible: Prof. Dr. Petra Nieken
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-106860 - Leadership & Sustainable HR-Management
M-WIWI-105928 - HR Management & Digital Workplace

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2573005	HR-Management 1: HR strategies in the age of AI	2 SWS	Lecture / 🗣	Nieken
WT 24/25	2573006	Übung zu HR-Management 1: HR Strategies in the age of AI	1 SWS	Practice / 🗣	Nieken, Mitarbeiter
Exams					
WT 24/25	7900200	HR-Management 1: HR strategies in the age of AI (formerly Human Resource Management)			Nieken

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

Competence Certificate
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

Recommendation
Prior attendance of the Business Administration module is recommended.

Below you will find excerpts from events related to this course:

V HR-Management 1: HR strategies in the age of AI

2573005, WS 24/25, 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.
- posses knowledge about the applicability and challenges of different scientific research methods and open science.

Workload

The total workload for this course is approximately 135 hours.

Lecture: 32 hours

Preparation of lecture: 52 hours

Exam preparation: 51 hours

Literature

- Personalmanagement, Stock-Homburg, 2019
- Personnel Economics, Kuhn, 2017
- Research papers and case studies (will be provided during the lecture)

T 5.68 Course: HR-Management 2: Organization, Fairness & Leadership [T-WIWI-114178]

Responsible: Prof. Dr. Petra Nieken
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101668 - Economic Policy I
M-WIWI-106860 - Leadership & Sustainable HR-Management

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2025	2573001	HR-Management 2: Organization, Fairness & Leadership	2 SWS	Lecture / 🗣	Nieken
ST 2025	2573002	Übung zu HR-Management 2: Organization, Fairness & Leadership	1 SWS	Practice / 🗣	Nieken, Mitarbeiter, Gorny
Exams					
ST 2025	7900133	HR-Management 2: Organization, Fairness & Leadership (formerly Personnel Policies and Labor Market Institutions)			Nieken

Legend: 💻 Online, 🎲 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Recommendation
Completion of module Business Administration is recommended.

Basic knowledge of microeconomics, game theory, and statistics is recommended.

Below you will find excerpts from events related to this course:

V HR-Management 2: Organization, Fairness & Leadership

2573001, SS 2025, 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 5.69 Course: Human-Machine-Interaction [T-INFO-114192]

Responsible: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: M-INFO-107166 - Human Computer Interaction

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

Events					
ST 2025	24659	Human-Computer-Interaction	2 SWS	Lecture /	Beigl, Lee
Exams					
ST 2025	7500048	Human-Machine-Interaction			Beigl

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

Competence Certificate
The assessment is carried out as a written examination (§ 4 Abs. 2 No. 1 SPO) lasting 60 minutes.

Prerequisites
Participation in the exercise is compulsory and the contents of the exercise are relevant for the examination.

T 5.70 Course: Human-Machine-Interaction Pass [T-INFO-114193]

Responsible: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: M-INFO-107166 - Human Computer Interaction

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each summer term	1

Events					
ST 2025	2400095	Human-Computer-Interaction	1 SWS	Practice /	Beigl, Lee
Exams					
ST 2025	7500121	Human-Machine-Interaction			Beigl

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

Competence Certificate
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.

Annotation
Participation in the exercise is compulsory and the contents of the exercise are relevant for the examination.

T 5.71 Course: Industrial Organization [T-WIWI-102844]

Responsible: Prof. Dr. Johannes Philipp Reiß
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101499 - Applied Microeconomics
M-WIWI-101501 - Economic Theory

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Irregular	1

Exams			
WT 24/25	7910003	Industrial Organization	Reiß

Competence Certificate
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

Recommendation
Completion of the module Economics [WW1VWL] is assumed.

Annotation
This course is not given in summer 2017.

T 5.72 Course: Information Security [T-INFO-112195]

Responsible: Prof. Dr. Hannes Hartenstein
Prof. Dr. Thorsten Strufe
Organisation: KIT Department of Informatics
Part of: M-INFO-106015 - Information Security

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each summer term	2

Events					
ST 2025	2400199	Informationssicherheit	3 SWS	Lecture / Practice (/ 🗣	Müller-Quade, Strufe, Hartenstein, Wressnegger
Exams					
WT 24/25	7500003	Information Security			Wressnegger, Müller-Quade, Strufe, Hartenstein
ST 2025	7500028	Information Security			Müller-Quade, Wressnegger, Strufe, Hartenstein

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-INFO-101371 - Security must not have been started.

T 5.73 Course: Information Systems 1 [T-WIWI-109817]

Responsible: Prof. Dr. Alexander Mädche
Prof. Dr. Jella Pfeiffer

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-104820 - Information Systems I
M-WIWI-104843 - Orientation Exam

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each winter term	2

Events					
WT 24/25	2500034	Tutorial for Information Systems I	2 SWS	Tutorial (/ ⛭	Mädche, Abeck
WT 24/25	2540425	Information Systems I	2 SWS	Lecture / ⛭	Mädche, Weinhardt
Exams					
WT 24/25	7900103	Information Systems 1			Mädche
ST 2025	7900279	Information Systems 1			Mädche

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

Competence Certificate
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, thebonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Prerequisites
None

Recommendation
None

Workload
120 hours

Below you will find excerpts from events related to this course:

V Information Systems I

2540425, WS 24/25, 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 obejectivs:

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 5.74 Course: Information Systems 2 [T-WIWI-109818]

Responsible: Prof. Dr. Jella Pfeiffer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-104821 - Information Systems II

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each summer term	1

Events					
ST 2025	2500029	Tutorien zu Wirtschaftsinformatik 2		Tutorial (	Hariharan
ST 2025	2540450	Information Systems II	2 SWS	Lecture / 🗣	Weinhardt, Pfeiffer
ST 2025	2540451	Übung zu Wirtschaftsinformatik II	2 SWS	Practice / 🗣	Pfeiffer
Exams					
WT 24/25	7900220	Information Systems 2			Weinhardt
ST 2025	7900325	Information Systems 2			Pfeiffer

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Prerequisites
None

Recommendation
None

Annotation
New course starting summer term 2020.

Workload
120 hours

T 5.75 Course: Intellectual Property and Data Protection [T-INFO-109840]

Responsible: N.N.
Organisation: KIT Department of Informatics
Part of: M-INFO-101253 - Intellectual Property and Data Protection

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each winter term	1

Events					
WT 24/25	2424018	Datenschutzrecht	2 SWS	Lecture / 🗣	Schneider, Werner
WT 24/25	2424070	Industrial Property and Copyright Law	2 SWS	Lecture / 🗣	Sattler
Exams					
WT 24/25	7500236	Intellectual Property and Data Protection			Sattler, Zufall
ST 2025	7500299	Intellectual Property and Data Protection			Sattler, Zufall

Legend: 📱 Online, 🌀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.76 Course: International Finance [T-WIWI-102646]

Responsible: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I
M-WIWI-101402 - eFinance

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	see Annotations	1

Events					
ST 2025	2530570	International Finance	2 SWS	Lecture / 🗣	Walter, Uhrig-Homburg
Exams					
WT 24/25	7900052	International Finance			Uhrig-Homburg
ST 2025	7900097	International Finance			Uhrig-Homburg

Legend: 💻 Online, 🎲 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Recommendation
None

Annotation
The course is offered as a 14-day or block course.

Below you will find excerpts from events related to this course:

V International Finance

2530570, SS 2025, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Organizational issues
Kickoff am Mittwoch, 30.04.25, 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 5.77 Course: Introduction in Computer Networks [T-INFO-102015]

Responsible: Prof. Dr. Martina Zitterbart
Organisation: KIT Department of Informatics
Part of: M-INFO-103455 - Introduction in Computer Networks

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each summer term	1

Events					
ST 2025	2424519	Einführung in Rechnernetze	2 SWS	Lecture / 🗣	Kopmann, Neumeister, Zitterbart
ST 2025	2424521	Übung zu Einführung in Rechnernetze	1 SWS	Practice / 🗣	Kopmann, Neumeister, Zitterbart
Exams					
WT 24/25	7500201	Introduction to Computer Networking			Zitterbart
ST 2025	7500116	Introduction to Computer Networking			Zitterbart

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.78 Course: Introduction to Artificial Intelligence [T-INFO-112194]

Responsible: TT-Prof. Dr. Pascal Friederich
Prof. Dr. Gerhard Neumann

Organisation: KIT Department of Informatics

Part of: M-INFO-106014 - Introduction to Artificial Intelligence

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	6

Events					
WT 24/25	2400158	Introduction to Artificial Intelligence	3 SWS	Lecture / Practice (/ 🗣	Neumann, Schäfer, Friederich
Exams					
WT 24/25	7500136	Introduction to Artificial Intelligence			Neumann, Schäfer, Friederich
ST 2025	7500058	Introduction to Artificial Intelligence			Neumann, Friederich, Schäfer

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.79 Course: Introduction to Energy Economics [T-WIWI-102746]

Responsible: Prof. Dr. Wolf Fichtner
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101464 - Energy Economics

Type	Credits	Grading scale	Recurrence	Version
Written examination	5,5	Grade to a third	Each summer term	7

Events					
ST 2025	2581010	Introduction to Energy Economics	2 SWS	Lecture / 🗣	Fichtner
ST 2025	2581011	Übungen zu Einführung in die Energiewirtschaft	2 SWS	Practice / 🗣	Sandmeier, Fichtner, Scharnhorst
Exams					
WT 24/25	7981010	Introduction to Energy Economics			Fichtner

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

Competence Certificate
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. Depending on the respective pandemic situation, the exam may be offered as an open book exam (alternative exam assessment, following §4(2), 3 of the examination regulation).

Prerequisites
None.

Below you will find excerpts from events related to this course:

V Introduction to Energy Economics

2581010, SS 2025, 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 5.80 Course: Introduction to Finance and Accounting [T-WIWI-112820]

Responsible: Dr. Torsten Luedecke
Prof. Dr. Martin Ruckes
Dr. Jan-Oliver Strych
Prof. Dr. Marliese Uhrig-Homburg
Prof. Dr. Marcus Wouters

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-105267 - Business Administration

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each summer term	2

Events					
ST 2025	2500025	Tutorial Introduction to Finance and Accounting	2 SWS	Tutorial (	Wouters, Ruckes, Assistenten, Kohl
ST 2025	2610026	Introduction to Finance and Accounting	2 SWS	Lecture / 🗣	Ruckes, Wouters, Thimme
Exams					
WT 24/25	7900005	Financing and Accounting			Ruckes, Wouters, Luedecke
ST 2025	7900043	Financing and Accounting			Ruckes, Wouters, Luedecke

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
Written Exam (150 min). The examination is offered at the beginning of each lecture-free period. Repeat examinations are possible at any regular examination date.

Workload
150 hours

Below you will find excerpts from events related to this course:

V Introduction to Finance and Accounting

2610026, SS 2025, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The lecture covers the following topics:

- Investment and Finance
  - Valuation of Bonds and Stocks
  - Capital Budgeting
  - Portfolio Theory
- Financial Accounting
- Management Accounting

Literature
Ausführliche Literaturhinweise werden in den Materialen zur Vorlesung gegeben.

T 5.81 Course: Introduction to Game Theory [T-WIWI-102850]

Responsible: Prof. Dr. Clemens Puppe
Prof. Dr. Johannes Philipp Reiß

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101499 - Applied Microeconomics
M-WIWI-101501 - Economic Theory

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	3

Events					
ST 2025	2520525	Introduction to Game Theory	2 SWS	Lecture / 🗣	Reiß
ST 2025	2520526	Übungen zu Einführung in die Spieltheorie	1 SWS	Practice / 🗣	Reiß, Potarca
Exams					
WT 24/25	7900006	Introduction to Game Theory			Puppe

Legend: 💻 Online, 🎲 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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.

Recommendation
Knowledge from the lecture "Economics I: Microeconomics" is recommended. Furthermore, basic knowledge of mathematics and statistics is assumed.

Below you will find excerpts from events related to this course:

V Introduction to Game Theory

2520525, SS 2025, 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.

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 resited at every ordinary examination date.

Recommendation: You should have passed the module [M-WIWI-101398] *Introduction to Economics.*

Recommendations:

Basic knowledge of mathematics and statistics is assumed.

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.

Compulsory textbook:

Gibbons (1992): A Primer in Game Theory, Harvester-Wheatsheaf.

Additional Literature:

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.

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 5.82 Course: Introduction to Machine Learning [T-WIWI-111028]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Dr. Abdolreza Nazemi
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-105482 - Machine Learning and Data Science

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	4,5	Grade to a third	Each winter term	1 terms	1

Events					
WT 24/25	2540539	Introduction to Machine Learning	2 SWS	Lecture / 🗣	Nazemi
WT 24/25	2540540	Übung zu Introduction to Machine Learning	1 SWS	Practice / 🗣	Nazemi
Exams					
WT 24/25	7900349	Introduction to Machine Learning (WS 2024/2025)			Geyer-Schulz
ST 2025	7900076	Introduction to Machine Learning			Geyer-Schulz

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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.

Workload
135 hours

Below you will find excerpts from events related to this course:

V Introduction to Machine Learning

2540539, WS 24/25, 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 5.83 Course: Introduction to Neural Networks and Genetic Algorithms [T-WIWI-111029]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-105482 - Machine Learning and Data Science

Type	Credits	Grading scale	Recurrence	Expansion	Version
Written examination	4,5	Grade to a third	Each summer term	1 terms	1

Events					
ST 2025	2540541	Introduction to Neural Networks and Genetic Algorithms	2 SWS	Lecture	Geyer-Schulz
ST 2025	2540542	Übung Introduction to Neural Networks and Genetic Algorithms	1 SWS	Practice	Geyer-Schulz
Exams					
WT 24/25	7900295	Introduction to Neural Networks and Genetic Algorithms (Nachklausur SoSe 2024)			Geyer-Schulz
ST 2025	7900303	Introduction to Neural Networks and Genetic Algorithms			Geyer-Schulz

Competence Certificate
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.

Workload
135 hours

Below you will find excerpts from events related to this course:

V Introduction to Neural Networks and Genetic Algorithms

2540541, SS 2025, 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 5.84 Course: Introduction to Operations Research I and II [T-WIWI-102758]

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

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101418 - Introduction to Operations Research

Type	Credits	Grading scale	Recurrence	Version
Written examination	9	Grade to a third	see Annotations	2

Events					
WT 24/25	2500030	Computer Exercises on Introduction to Operations Research II	1 SWS	Tutorial (/	Dunke
WT 24/25	2530043	Introduction to Operations Reseasrch II		Lecture /	Nickel
WT 24/25	2530044			Tutorial (/	Dunke
WT 24/25	2550043	Introduction to Operations Research II		Lecture /	Nickel
ST 2025	2500008	Computer Exercises on Introduction to Operations Research I	1 SWS	Tutorial (/	Dunke
ST 2025	2550040	Introduction to Operations Research I	2 SWS	Lecture /	Stein
ST 2025	2550043	Tutorials on Introduction to Operations Research I	2 SWS	Tutorial (/	Dunke
Exams					
WT 24/25	00060	Introduction to Operations Research I and II			Nickel

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

Competence Certificate
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

Recommendation
Knowledge of Mathematics I and II is recommended, as well as programming knowledge for the software laboratory.
It is strongly recommended to attend the course Introduction to Operations Research I
[2550040] before attending the courseIntroduction to Operations Research II
[2530043].

Workload
270 hours

Below you will find excerpts from events related to this course:

V **Introduction to Operations Reseasrch II** — **Lecture (V) On-Site**
2530043, WS 24/25, SWS, Language: German, Open in study portal

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, Stein, Waldmann: Operations Research, 2. Auflage, Springer, 2014
- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005
- Murty: Operations Research. Prentice-Hall, 1995
- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006
- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

V

Introduction to Operations Research II

2550043, WS 24/25, SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
Integer and Combinatorial Programming: Basic notions, cutting plane metehods, branch and bound methods, branch and cut methods, heuristics.

Nonlinear Programming: Basic notions, optimality conditions, solution methods for convex and nonconvex optimization problems.

Dynamic and stochastic models and methods: dynamical programming, Bellman method, lot sizing models, dyanical and stochastic inventory models, queuing theory.

Learning objectives:

The student

- names and describes basic notions of integer and combinatorial optimization, nonlinear programming, and dynamic programming,
- 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, Stein, Waldmann: Operations Research, 2. Auflage, Springer, 2014
- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005
- Murty: Operations Research. Prentice-Hall, 1995
- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006
- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

V

Introduction to Operations Research I

2550040, SS 2025, 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 5.85 Course: Introduction to Public Finance [T-WIWI-102877]

Responsible: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101403 - Public Finance

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2560131	Introduction to Public Finance	3 SWS	Lecture /	Wigger
Exams					
WT 24/25	790fiwi	Introduction to Public Finance			Wigger
ST 2025	790fiwi	Introduction to Public Finance			Wigger

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

Competence Certificate
Depending on the further pandemic development the assessment will consist either of an open book exam (following Art. 4, para. 2, clause 3 of the examination regulation), or of an 1h written exam (following Art. 4, para. 2, clause 1 of the examination regulation).

Prerequisites
None

Below you will find excerpts from events related to this course:

V Introduction to Public Finance

2560131, WS 24/25, 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 5.86 Course: Introduction to Stochastic Optimization [T-WIWI-106546]

Responsible: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103278 - Optimization under Uncertainty

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	3

Events					
ST 2025	2550470	Introduction to Stochastic Optimization	2 SWS	Lecture /	Rebennack
ST 2025	2550471	Übung zur Einführung in die Stochastische Optimierung	1 SWS	Practice /	Rebennack, Kandora
ST 2025	2550474	Rechnerübung zur Einführung in die Stochastische Optimierung	2 SWS	Others (sons	Rebennack, Kandora
Exams					
WT 24/25	7900242	Introduction to Stochastic Optimization			Rebennack
ST 2025	7900311	Introduction to Stochastic Optimization			Rebennack

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

Competence Certificate
The assessment consists of a written exam (60 minutes). The exam takes place in every semester.

Prerequisites
None.

Workload
135 hours

T 5.87 Course: Investments [T-WIWI-102604]

Responsible: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101435 - Essentials of Finance

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2025	2530575	Investments	2 SWS	Lecture / 🗣	Uhrig-Homburg, Thimme
ST 2025	2530576	Übung zu Investments	1 SWS	Practice / 🗣	Uhrig-Homburg, Kargus, Thimme
Exams					
WT 24/25	7900054	Investments			Uhrig-Homburg
ST 2025	7900109	Investments			Uhrig-Homburg

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
Depending on further pandemic developments, the examination will be offered either as a 60-minute written examination or as an open-book examination (alternative exam assessment).

A bonus can be earned by correctly solving at least 50% of the posed bonus 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.

Prerequisites
None

Recommendation
Knowledge of Business Administration: Finance and Accounting [2610026] is recommended.

Below you will find excerpts from events related to this course:

V **Investments** — **Lecture (V) On-Site**
2530575, SS 2025, 2 SWS, Language: German, Open in study portal

Literature
Weiterführende Literatur:

Bodie/Kane/Marcus (2010): Essentials of Investments, 8. Aufl., McGraw-Hill Irwin, Boston

T 5.88 Course: Lab Protocol Engineering [T-INFO-102066]

Responsible: Prof. Dr. Martina Zitterbart
Organisation: KIT Department of Informatics
Part of: M-INFO-101247 - Lab Protocol Engineering

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each winter term	3

Events					
WT 24/25	2400107	Basispraktikum Protocol Engineering	4 SWS	Practical course	König, Zitterbart, Mahrt
Exams					
WT 24/25	7500023	Lab Protocol Engineering			Zitterbart

T 5.89 Course: Lab: Working with Database Systems [T-INFO-103552]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-105589 - Introduction to Data and Information Management
M-INFO-101865 - Lab: Working with Database Systems

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	4	pass/fail	Each winter term	2

Events					
WT 24/25	2424317	Arbeiten mit Datenbanksystemen	2 SWS	Practical course / 🗣	Böhm, Richter
Exams					
WT 24/25	7500146	Lab: Working with Database Systems			Böhm, Mülle

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.90 Course: Logistics and Supply Chain Management [T-WIWI-102870]

Responsible: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101437 - Industrial Production I

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each summer term	2

Events					
ST 2025	2581996	Logistics and Supply Chain Management	2 SWS	Lecture / 🗣	Schultmann, Rosenberg
Exams					
WT 24/25	7981996	Logistics and Supply Chain Management			Schultmann

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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 events related to this course:

V Logistics and Supply Chain Management

2581996, SS 2025, 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 5.91 Course: Macroeconomic Theory [T-WIWI-109121]

Responsible: Prof. Dr. Johannes Brumm
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101668 - Economic Policy I
M-WIWI-101501 - Economic Theory
M-WIWI-106472 - Advanced Macroeconomics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	3

Events					
WT 24/25	2560404	Macroeconomic Theory	2 SWS	Lecture / 🗣	Brumm
WT 24/25	2560405	Übung zu Macroeconomic Theory	1 SWS	Practice / 🗣	Pegorari
Exams					
WT 24/25	7900264	Macroeconomic Theory			Brumm

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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 events related to this course:

V Macroeconomic Theory

2560404, WS 24/25, 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 5.92 Course: Macroeconomics: Theory and Computation [T-WIWI-112735]

Responsible: Prof. Dr. Johannes Brumm
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-106472 - Advanced Macroeconomics

Type	Credits	Grading scale	Recurrence	Version
Written examination	9	Grade to a third	Each term	1

Competence Certificate
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.

Annotation
Teaching and learning format: Lecture and exercise

Workload
270 hours

T 5.93 Course: Macro-Finance [T-WIWI-106194]

Responsible: Prof. Dr. Maxim Ulrich
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103120 - Financial Economics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Irregular	2

Competence Certificate
The grade is based on an exam. The exam covers all the material that is taught in the current semester. The exam takes place in the last week of the lecture-free period. Students who fail the exam are allowed to retake it in the following semester (last week of the respective lecture-free period).

Prerequisites
None.

Recommendation
None

Annotation
Teaching and learning format: Lecture and exercise

Workload
135 hours

T 5.94 Course: Management and Marketing [T-WIWI-111594]

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

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-105267 - Business Administration

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	2

Events					
WT 24/25	2600023	Management	2 SWS	Lecture / 🗣	Nieken, Lindstädt, Terzidis
WT 24/25	2610026	Marketing	2 SWS	Lecture / 🗣	Klarmann
Exams					
WT 24/25	7900012	Management and Marketing			Nieken, Terzidis, Klarmann, Lindstädt
ST 2025	7900184	Management and Marketing			Nieken, Terzidis, Klarmann

Legend: 🖥 Online, 🎲 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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 events related to this course:

V **Marketing** — **Lecture (V) On-Site**
2610026, WS 24/25, 2 SWS, Language: German, Open in study portal

Literature
Ausführliche Literaturhinweise werden in den Materialen zur Vorlesung gegeben.

T 5.95 Course: Managing Organizations [T-WIWI-102630]

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101425 - Strategy and Organization

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each winter term	4

Events					
WT 24/25	2577902	Managing Organizations	2 SWS	Lecture / 🗣	Lindstädt
Exams					
WT 24/25	7900049	Managing Organizations			Lindstädt
ST 2025	7900066	Managing Organizations			Lindstädt

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Below you will find excerpts from events related to this course:

V Managing Organizations

2577902, WS 24/25, 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

Verification:

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 5.96 Course: Managing the Marketing Mix [T-WIWI-102805]

Responsible: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101424 - Foundations of Marketing

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each summer term	2

Events					
ST 2025	2571152	Managing the Marketing Mix	2 SWS	Lecture / 🗣	Klarmann
ST 2025	2571153	Übung zu Marketing Mix (Bachelor)	1 SWS	Practice / 🗣	Daumann, Weber
Exams					
WT 24/25	7900061	Managing the Marketing Mix			Klarmann
ST 2025	7900023	Managing the Marketing Mix			Klarmann

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Annotation
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 events related to this course:

V **Managing the Marketing Mix** — **Lecture (V) On-Site**
2571152, SS 2025, 2 SWS, Language: German, Open in study portal

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 5.97 Course: MARS Basis Lab [T-INFO-102053]

Responsible: Prof. Dr.-Ing. Carsten Dachsbacher
Organisation: KIT Department of Informatics
Part of: M-INFO-101245 - MARS-Based Internship

Type	Credits	Grading scale	Version
Examination of another type	4	Grade to a third	1

Events					
WT 24/25	2400027	MARS-practical course	2 SWS	Practical course / 🧩	Hoffmann, Prautzsch
ST 2025	2400188	MARS-practical course	2 SWS	Practical course / 🗣	Hoffmann, Dachsbacher
Exams					
WT 24/25	7500170	MARS Basis Lab			Prautzsch

Legend: 💻 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Below you will find excerpts from events related to this course:

V MARS-practical course

2400188, SS 2025, 2 SWS, Language: German/English, Open in study portal

Practical course (P)
On-Site

Content
Introduction to the modeling, analysis, reconstruction, and simulation of geometric data (MARS geometry) using small practical example problems with conventional techniques of curve and surface design, which are used in numerous CAD systems. As part of the practical course, we extend a Python class library with methods and classes.

T 5.98 Course: Mathematics I for Information Systems - Exam [T-MATH-109942]

Responsible: 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 scale	Recurrence	Version
Written examination	7	Grade to a third	Each term	1

Events					
WT 24/25	0136000	Mathematik 1 für die Fachrichtung Wirtschaftsinformatik und Digital Economics	4 SWS	Lecture / 🗣	Weiß
Exams					
WT 24/25	7700054	Mathematics I for Information Systems - Exam			Weiß

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Annotation
This exam is part of the orientation exam.

T 5.99 Course: Mathematics I for Information Systems - Exercise [T-MATH-109943]

Responsible: 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 scale	Recurrence	Version
Completed coursework	1	pass/fail	Each winter term	2

Events					
WT 24/25	0136000	Mathematik 1 für die Fachrichtung Wirtschaftsinformatik und Digital Economics	4 SWS	Lecture / 🗣	Weiß
Exams					
WT 24/25	7700053	Mathematics I for Information Systems - Exercise			Weiß

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Annotation
This exam is part of the orientation exam.

T 5.100 Course: Mathematics II for Information Systems - Exam [T-MATH-109944]

Responsible: 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 scale	Recurrence	Version
Written examination	7	Grade to a third	Each term	1

Events					
ST 2025	0187700	Mathematik II für Wirtschaftsinformatik und Digital Economics	4 SWS	Lecture	Weiß
Exams					
WT 24/25	7700044	Mathematics II for Information Systems - Exam			Weiß

T 5.101 Course: Mathematics II for Information Systems - Exercise [T-MATH-109945]

Responsible: 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 scale	Recurrence	Version
Completed coursework	1	pass/fail	Each summer term	2

T 5.102 Course: Mechano-Informatics and Robotics [T-INFO-101294]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: M-INFO-100757 - Mechano-Informatics and Robotics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4	Grade to a third	Each winter term	1

Events					
WT 24/25	2400077	Mechano-Informatics and Robotics	2 SWS	Lecture / 🗣	Asfour, Krebs, Rietsch, Gao
Exams					
WT 24/25	7500176	Mechano-Informatics and Robotics			Asfour
ST 2025	7500217	Mechano-Informatics and Robotics			Asfour

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment is carried out as a written examination (§ 4 Abs. 2 No. 1 SPO) lasting 60 minutes.

Prerequisites
None.

Recommendation
Basispraktikum Mobile Roboter

Below you will find excerpts from events related to this course:

V Mechano-Informatics and Robotics

2400077, WS 24/25, 2 SWS, Language: German/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
Zugehörige Veranstaltungen: Empfehlung - Basispraktikum Mobile Roboter

Die Erfolgskontrolle erfolgt in Form einer schriftlichen Prüfung in englischer Sprache im Umfang von i.d.R. 60 Minuten nach § 4 Abs. 2 Nr. 1 SPO.

Arbeitsaufwand:

2h Präsenz

+ 2*2h = 4h Vor/Nachbereitung

+ 30h Prüfungsvorbereitung

120h

T 5.103 Course: Microeconometrics [T-WIWI-112153]

Responsible: Prof. Dr. Fabian Krüger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-105414 - Statistics and Econometrics II
M-WIWI-101599 - Statistics and Econometrics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	see Annotations	1

Exams			
WT 24/25	7700004	Microeconometrics	Krüger

Competence Certificate
The assessment consists of a written examination (60 minutes). 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

Recommendation
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').

Annotation
The course will be offered in the summer semester 2024.

Workload
135 hours

T 5.104 Course: Microprocessors I [T-INFO-101972]

Responsible: Prof. Dr. Wolfgang Karl
Organisation: KIT Department of Informatics
Part of: M-INFO-101183 - Microprocessors I

Type	Credits	Grading scale	Recurrence	Version
Oral examination	3	Grade to a third	Each summer term	1

Events					
ST 2025	2424688	Microprocessors I	2 SWS	Lecture / 🗣	Karl
Exams					
WT 24/25	7500271	VL: Microprocessors I			Karl

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.105 Course: Mobile Computing and Internet of Things [T-INFO-102061]

Responsible: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: M-INFO-101249 - Mobile Computing and Internet of Things

Type	Credits	Grading scale	Recurrence	Version
Written examination	2,5	Grade to a third	Each winter term	6

Events					
WT 24/25	2400051	Mobile Computing and Internet of Things		Lecture / Practice (	Beigl, Röddiger
Exams					
WT 24/25	7500287_1	Mobile Computing and Internet of Things			Beigl
ST 2025	7500350	Mobile Computing and Internet of Things			Beigl

Prerequisites
Exercise certificate must be submitted.

T 5.106 Course: Mobile Computing and Internet of Things - Exercise [T-INFO-113119]

Responsible: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: M-INFO-101249 - Mobile Computing and Internet of Things

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	2,5	Grade to a third	Each winter term	3

Events					
WT 24/25	2400051	Mobile Computing and Internet of Things		Lecture / Practice (	Beigl, Röddiger
Exams					
WT 24/25	7500358	Mobile Computing and Internet of Things			Beigl

Annotation
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 5.107 Course: Mobile Robots – Practical Course [T-INFO-101992]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: M-INFO-101184 - Mobile Robots – Practical Course

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	4	pass/fail	Each summer term	2

Events					
ST 2025	24624	Mobile Robots - Practical Course	4 SWS	Practical course / 🗣	Asfour
Exams					
ST 2025	7500264	Mobile Robots – Practical Course			Asfour

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Below you will find excerpts from events related to this course:

V Mobile Robots - Practical Course

24624, SS 2025, 4 SWS, Language: German, Open in study portal

Practical course (P)
On-Site

Content
In this practical course, students assemble an ARMURO robot in groups of two. Each student will be provided with their own robot, which they have to put into operation. While using the robots, a new set of problems will be solved each week. The students will need to prepare for each weak given the provided material. Sets of problem be solved using the C language and focus on controlling the robot's sensors and actuators as well as on the generation of reflex-based behavior. The course ends with a race, where the robots have to tackle an obstacle course.

Learning Objectives:

Students are able to 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 is able to 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

T 5.108 Course: Modeling and OR-Software: Introduction [T-WIWI-106199]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101413 - Applications of Operations Research

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	4

Events					
ST 2025	2550490	Modellieren und OR-Software: Einführung	3 SWS	Practical course / 🧩	Nickel, Linner, Pomes, Subas
Exams					
WT 24/25	7900081	Modeling and OR-Software: Introduction			Nickel
ST 2025	7900153	Modeling and OR-Software: Introduction			Nickel

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment is a written examination (60 min.). The examination is held in every semester.

Recommendation
Firm knowledge of the contents from the lecture *Introduction to Operations Research I* [2550040] of the module *Operations Research*.

Annotation
Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.

The lecture is offered in every term. The planned lectures and courses for the next three years are announced online.

Below you will find excerpts from events related to this course:

V Modellieren und OR-Software: Einführung

2550490, SS 2025, 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, ...), the software IBM ILOG CPLEX Optimization Studio and the corresponding modeling language OPL 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

Der Bewerbungszeitraum ist vom 07.03.25 bis zum 30.03.25.

Die Kick-Off Veranstaltung findet am 30.04.25 um 09:45 Uhr statt.

T 5.109 Course: Nonlinear Optimization I [T-WIWI-102724]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103278 - Optimization under Uncertainty
M-WIWI-101936 - Methodical Foundations of OR

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	4

Events					
WT 24/25	2550111	Nonlinear Optimization I	2 SWS	Lecture / 🗣	Stein
WT 24/25	2550112	Exercises Nonlinear Optimization I	1 SWS	Practice / 🗣	Stein, Schwarze, Neussel
Exams					
WT 24/25	7900001_WS2425_HK	Nonlinear Optimization I			Stein
ST 2025	7900202_SS2025_NK	Nonlinear Optimization I			Stein

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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.

Annotation
Part I and II of the lecture are held consecutively in the *same* semester.

Below you will find excerpts from events related to this course:

V Nonlinear Optimization I

2550111, WS 24/25, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality condtions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of optimization problems *with* constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

Learning objectives:

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

Literature

O. Stein, Grundzüge der Nichtlinearen Optimierung, 2. Aufl., SpringerSpektrum, 2021

Weiterführende Literatur:

- 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 5.110 Course: Nonlinear Optimization I and II [T-WIWI-103637]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101936 - Methodical Foundations of OR

Type	Credits	Grading scale	Recurrence	Version
Written examination	9	Grade to a third	Each winter term	6

Events					
WT 24/25	2550111	Nonlinear Optimization I	2 SWS	Lecture / 🗣	Stein
WT 24/25	2550112	Exercises Nonlinear Optimization I	1 SWS	Practice / 🗣	Stein, Schwarze, Neussel
WT 24/25	2550113	Nonlinear Optimization II	2 SWS	Lecture / 🗣	Stein
Exams					
WT 24/25	7900003_WS2425_HK	Nonlinear Optimization I and II			Stein
ST 2025	7900204_SS2025_NK	Nonlinear Optimization I and II			Stein

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

Competence Certificate
The assessment consits of a written exam (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.

Annotation
Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from events related to this course:

V Nonlinear Optimization I

2550111, WS 24/25, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality condtions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of optimization problems *with* constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

Learning objectives:

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

Literature
O. Stein, Grundzüge der Nichtlinearen Optimierung, 2. Aufl., SpringerSpektrum, 2021

Weiterführende Literatur:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

V

Nonlinear Optimization II

2550113, WS 24/25, 2 SWS, Language: German, 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, Grundzüge der Nichtlinearen Optimierung, 2. Aufl., SpringerSpektrum, 2021

Weiterführende Literatur:

- 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 5.111 Course: Nonlinear Optimization II [T-WIWI-102725]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101936 - Methodical Foundations of OR

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	3

Events					
WT 24/25	2550112	Exercises Nonlinear Optimization I	1 SWS	Practice / 🗣	Stein, Schwarze, Neussel
WT 24/25	2550113	Nonlinear Optimization II	2 SWS	Lecture / 🗣	Stein
Exams					
WT 24/25	7900002_WS2425_HK	Nonlinear Optimization II			Stein
ST 2025	7900203_SS2025_NK	Nonlinear Optimization II			Stein

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment consits 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 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.

Annotation
Part I and II of the lecture are held consecutively in the same semester.

Below you will find excerpts from events related to this course:

V Nonlinear Optimization II

2550113, WS 24/25, 2 SWS, Language: German, 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, Grundzüge der Nichtlinearen Optimierung, 2. Aufl., SpringerSpektrum, 2021

Weiterführende Literatur:

- 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 5.112 Course: Operating Systems [T-INFO-101969]

Responsible: Prof. Dr.-Ing. Frank Bellosa
Organisation: KIT Department of Informatics
Part of: M-INFO-101177 - Operating Systems

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each winter term	2

Events					
WT 24/25	2424009	Operating Systems	4 SWS	Lecture / 🗣	Bellosa, Maucher, Werling, Habicht
Exams					
WT 24/25	7500069	Operating Systems			Bellosa
ST 2025	7500095	Operating Systems			Bellosa

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Below you will find excerpts from events related to this course:

V Operating Systems

2424009, WS 24/25, 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 5.113 Course: Optimization under Uncertainty [T-WIWI-106545]

Responsible: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103278 - Optimization under Uncertainty
M-WIWI-101413 - Applications of Operations Research

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	3

Events					
WT 24/25	2550464	Optimization Under Uncertainty	2 SWS	Lecture /	Rebennack
WT 24/25	2550465	Übungen zu Optimierungsansätze unter Unsicherheit	1 SWS	Practice /	Rebennack
WT 24/25	2550466		2 SWS	Others (sons	Rebennack
Exams					
WT 24/25	7900240	Optimization under Uncertainty			Rebennack
ST 2025	7900309	Optimization under Uncertainty			Rebennack

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

Competence Certificate
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 5.114 Course: Platform Economy [T-WIWI-107506]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101421 - Supply Chain Management
M-WIWI-101434 - eBusiness and Service Management
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each winter term	3

Events					
WT 24/25	2540468	Platform Economy	2 SWS	Lecture / 🗣	Weinhardt, Fegert
WT 24/25	2540469	Übung zu Platform Economy	1 SWS	Practice / 🗣	Stano
Exams					
WT 24/25	7900213	Platform Economy			Weinhardt

Legend: 💻 Online, 🎲 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Recommendation
None

Workload
135 hours

Below you will find excerpts from events related to this course:

V Platform Economy

2540468, WS 24/25, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The lecture kick-off this Semester will take place on the 29th of October 2024.

Lecture and Exercise

The "Platform Economy" lecture provides a broad range of knowledge related to online platforms and their business models, examining their significance for users, operators, and society as a whole. The course is structured into 8 topical blocks, each exploring a different aspect of the platform economy in depth. Each block is led by a different lecturer who is an expert in the respective topic. The key topics covered in the lecture include:

Network Effects and Two-Sided Markets

- Business Models and Auctions
- Energy Market Engineering
- Digital Involvement: Crowd X & Citizen Science
- Digital Democracy and Social Media
- Analyzing User Behavior
- Trust and Reputation in Digital Platforms
- Ethical Considerations in the Platform Economy

To reinforce the lecture material, each block is accompanied by interactive exercises that encourage a deeper understanding of the topics. In these exercises, students will engage in discussions and explore practical examples that illustrate the theoretical concepts introduced during the lectures. The lecture and exercise also offer a chance to get an idea of the lectures offered during the master's program at our chair.

Case Study

In addition to the lectures, you will work on a case study in small groups. Your task will be to develop a business model for an innovative and novel online platform, which will be presented to you by one of our experts, either from the academic team or the industry. This case study offers a chance to gain deeper insights into current trends in the platform economy and to apply the knowledge acquired throughout the course in a practical, hands-on way.

Literature

- Bundesministerium für Wirtschaft und Energie (2017). „Kompetenzen für eine digitale Sourveränität“(abrufbar unter https://www.bmwi.de/Redaktion/DE/Publikationen/Studien/kompetenzen-fuer-eine-digitale-souveraenitaet.html)
- Bundesministerium für Wirtschaft und Energie (2017). „Weißbuch Digitale Plattformen.“ (abrufbar unter https://www.bmwi.de/Redaktion/DE/Publikationen/Digitale-Welt/weissbuch-digitale-plattformen.pdf?__blob=publicationFile&v=8)
- Easley, D., and Kleinberg, J. 2010. “Network Effects,” in Networks, Crowds, and Markets: Reasoning about a Highly Connected World, Cambridge University Press, pp. 509–542.
- Eisenmann, T., Parker, G., and Van Alstyne, M. W. 2006. “Strategies for two-sided markets,” Harvard Business Review 84(10), pp. 1–11.
- Gassmann, O., Frankenberger, K., and Csik, M. 2013. Geschäftsmodelle entwickeln: 55 innovative Konzepte mit dem St. Galler Business Model Navigator, Hanser.
- Wattenhofer, R. 2016. “The science of the blockchain.” CreateSpace Independent Publishing Platform.
- Roth, A. 2002. “The Economist as Engineer: Game Theory, Experimental Economics and Computation as Tools for Design Economics,” Econometrica 70(4): 1341-1378, 2002.
- Weinhardt, C. ,Holtmann, C., Neumann, D., Market Engineering. Wirtschaftsinformatik, 2003.
- Wolfstetter, E., 1999. “Topics in Microeconomics - Industrial Organization, Auctions, and Incentives,” Cambridge, Cambridge University Press.
- Teubner, T., and Hawlitschek, F. (in press). “The economics of P2P online sharing,” in The Sharing Economy: Possibilities, Challenges, and the way forward, Praeger Publishing.

T 5.115 Course: Practical Course Computer Engineering: Hardware Design [T-INFO-102011]

Responsible: Prof. Dr. Wolfgang Karl
Organisation: KIT Department of Informatics
Part of: M-INFO-101219 - Practical Course Computer Engineering: Hardware Design

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4	Grade to a third	Each winter term	1

Events					
WT 24/25	2424309	Basispraktikum TI: Hardware-related System Design	4 SWS	Practical course	Nassar, Demirdag, Alsharkawy, Henkel
Exams					
WT 24/25	7500037	Lab Course: Hardware-Aware System Design			Karl

Below you will find excerpts from events related to this course:

V Basispraktikum TI: Hardware-related System Design

2424309, WS 24/25, 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 5.116 Course: Practical Course Web Applications and Service-Oriented Architectures (I) [T-INFO-103119]

Responsible: Prof. Dr. Sebastian Abeck
Organisation: KIT Department of Informatics
Part of: M-INFO-101633 - Practical Course Web Applications and Service-Oriented Architectures (I)

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	5	Grade to a third	Each winter term	2

Events					
WT 24/25	2424312	Basispraktikum Microservice2Go (I)	2 SWS	Practical course / 🗣	Abeck, Schneider, Sänger
Exams					
WT 24/25	7500029	Practical Course Web Applications and Service-oriented Architectures (I)			Abeck

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.117 Course: Practical Course: AI for Climate and Weather Predictions [T-INFO-113659]

Responsible: TT-Prof. Dr. Peer Nowack
Organisation: KIT Department of Informatics
Part of: M-INFO-106800 - Practical Course: AI for Climate and Weather Predictions

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	6	Grade to a third	Irregular	1

Events					
WT 24/25	2400064	AI for climate and weather predictions	2 SWS	Practical course / 🗣	Nowack
ST 2025	2400082	AI for climate and weather predictions	3 SWS	Practical course / 🗣	Nowack
Exams					
WT 24/25	7500394	Practical Course: AI for Climate and Weather Predictions			Nowack
ST 2025	7500036	Practical Course: AI for Climate and Weather Predictions			Nowack

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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
- Previous programming experience, e.g., in scientific contexts or in computer science, is required.
- Students should have previous experience in the theory and implementation of machine learning models.

Recommendation
- Knowledge of the Python programming language.
- Good knowledge of mathematical concepts such as linear algebra is an advantage.
- An interest in scientific questions around climate science and weather forecasting.

Below you will find excerpts from events related to this course:

V AI for climate and weather predictions

2400064, WS 24/25, 2 SWS, Language: English, Open in study portal

Practical course (P)
On-Site

Content

Content:

Students will learn how to work with state-of-the-art AI models for climate science and weather forecasting.

For example, typical AI models will include recent releases of

- Foundation models for climate science and weather forecasting.
- Generative AI models for tasks such as ensemble generation of weather forecasts and of climate change simulations for uncertainty quantification.
- Transformer and graph neural network models for weather forecasting.
- Climate model emulators.

Each student will be able to select from a variety of topics to explore in their practical experiments. These could include, but are not limited to:

- The representation of physical concepts in data-driven AI models (e.g., does the model indirectly learn to "understand physics"?).
- Detecting and understanding failure modes of AI models.
- Forecast accuracy and uncertainty quantification for AI-generated ensembles of simulations.
- Effective solutions to post-processing AI results and/or to modifying AI model architectures.
- Assessing if certain AI architectures perform significantly better for specific tasks.

Workload:

In-person introductory session, individual and group meetings, final presentation sessions: 30h

Practical tasks – getting started, implementation, experiments, analysis: 100h

Write up results in the style of a scientific paper and preparation of final presentation: 50h

V

AI for climate and weather predictions

2400082, SS 2025, 3 SWS, Language: English, Open in study portal

Practical course (P)
On-Site

Content

Content:

Students will learn how to work with state-of-the-art AI models for climate science and weather forecasting.

For example, typical AI models will include recent releases of

- Foundation models for climate science and weather forecasting.
- Generative AI models for tasks such as ensemble generation of weather forecasts and of climate change simulations for uncertainty quantification.
- Transformer and graph neural network models for weather forecasting.
- Climate model emulators.

Each student will be able to select from a variety of topics to explore in their practical experiments. These could include, but are not limited to:

- The representation of physical concepts in data-driven AI models (e.g., does the model indirectly learn to "understand physics"?).
- Detecting and understanding failure modes of AI models.
- Forecast accuracy and uncertainty quantification for AI-generated ensembles of simulations.
- Effective solutions to post-processing AI results and/or to modifying AI model architectures.
- Assessing if certain AI architectures perform significantly better for specific tasks.

Workload:

In-person introductory session, individual and group meetings, final presentation sessions: 30h

Practical tasks – getting started, implementation, experiments, analysis: 100h

Write up results in the style of a scientific paper and preparation of final presentation: 50h

T 5.118 Course: Practical Course: Lego Mindstorms [T-INFO-107502]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: M-INFO-102557 - Lego Mindstorms - Practical Course

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	4	pass/fail	Each winter term	1

Events					
WT 24/25	2424306	Lego Mindstorms - Laboratory	3 SWS	Practical course / 🗣	Asfour, Klas, Ruffler
Exams					
WT 24/25	7500179	Lego Mindstorms - Practical Course			Asfour

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Prerequisites
None.

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

Below you will find excerpts from events related to this course:

V Lego Mindstorms - Laboratory

2424306, WS 24/25, 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.

Ansprechpartner: Cornelius Klas

E-Mail: cornelius.klas@kit.edu

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 5.119 Course: Practical Course: Managing Scientific Data [T-INFO-112809]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-106311 - Practical Course: Managing Scientific Data

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	4	pass/fail	Irregular	1

Events					
WT 24/25	2400188	Managing Scientific Data	2 SWS	Practical course / 🗣	Böhm, Betsche
Exams					
WT 24/25	7500045	Practical Course: Managing Scientific Data			Böhm, Mülle
ST 2025	7500035	Practical Course: Managing Scientific Data			Böhm, Friederich

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.120 Course: Practical Seminar: Digital Services [T-WIWI-110888]

Responsible: Prof. Dr. Gerhard Satzger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-102752 - Fundamentals of Digital Service Systems
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each summer term	1

Competence Certificate
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

Recommendation
None

Annotation
The current range of seminar topics is announced on the following Website:
www.dsi.iism.kit.edu.

T 5.121 Course: Practical Seminar: Interactive Systems [T-WIWI-111914]

Responsible: Prof. Dr. Alexander Mädche
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-105928 - HR Management & Digital Workplace
M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each term	1

Events					
WT 24/25	2540555	Practical Seminar: Interactive Systems	3 SWS	Lecture /	Mädche
ST 2025	2540555	Practical Seminar: Interactive Systems	3 SWS	Lecture /	Mädche
Exams					
WT 24/25	7900367	Practical Seminar: Interactive Systems			Mädche

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

Competence Certificate
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 events related to this course:

V Practical Seminar: Interactive Systems

2540555, SS 2025, 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 5.122 Course: Practical Seminar: Platform Economy [T-WIWI-112154]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-105981 - Information Systems & Digital Business

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each term	1

Competence Certificate
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.

Annotation
Teaching and learning format: Seminar

Workload
135 hours

T 5.123 Course: Problem Solving, Communication and Leadership [T-WIWI-102871]

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101425 - Strategy and Organization

Type	Credits	Grading scale	Recurrence	Version
Written examination	2	Grade to a third	Each summer term	2

Events					
ST 2025	2577910	Problem solving, communication and leadership	1 SWS	Lecture / 🗣	Lindstädt
Exams					
WT 24/25	7900070	Problem Solving, Communication and Leadership			Lindstädt
ST 2025	7900068	Problem Solving, Communication and Leadership			Lindstädt

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment consists of a written exam (30 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

Below you will find excerpts from events related to this course:

V **Problem solving, communication and leadership** — **Lecture (V) On-Site**
2577910, SS 2025, 1 SWS, Language: German, Open in study portal

Content
The course highlights the aspects of problem solving and communication by first providing a structured look at how problem solving processes work. Participants will be empowered to identify, structure, analyze and communicate problems effectively. In addition, they are introduced to precise concepts for systematically structuring problem-solving processes. They learn how to apply and analyze structured communication in diagrams and presentations.

In addition, the course teaches key leadership concepts and frameworks that address the influence of situation, leadership personality and characteristics of those being led. Driven by current and practical perspectives, the course thus aims to teach cross-disciplinary skills.

In addition, through intensive interaction via selected case studies, participants are prepared for the practical application of what they have learned in various professional contexts.

Structure

The lectures of the course are available to students online as recordings, while the course dates are reserved for active discussion of practice-relevant case studies.

Learning Objectives

Upon completion of the course, students will be able to,

- structure problem-solving processes,
- apply the principles of goal-oriented communication in diagrams and presentations,
- Understand leadership decisions and place them in the context of situation and personality.

Recommendations:

None.

Workload:

- Total workload for 2 credit hours: approximately 30*2 hours.
- Thereof attendance time: 12-14 hours
- Remainder for preparation and post-processing as well as exam preparation.

Evidence:

Depending on further pandemic developments, the exam will be offered in the summer semester 2021 either as an open-book exam (exam performance of other kind according to SPO § 4 Abs. 2, Pkt. 3), or as a 60-minute written exam (written exam according to SPO § 4 Abs. 2, Pkt. 1).

It is expected that the exam will take place at the beginning of the semester's lecture-free period.

The examination is offered every semester and can be repeated at any regular examination date.

Organizational issues
Blockveranstaltung, Termine werden bekannt gegeben

Literature
Verpflichtende Literatur:

Die relevanten Auszüge und zusätzlichen Quellen werden in der Veranstaltung bekannt gegeben.

Ergänzende Literatur:

- Hungenberg, Harlad: Problemlösung und Kommunikation, 3. Aufl. München 2010

- Zelazny, Gene; Delker, Christel: Wie aus zahlen Bilder werden, 6. Aufl. Wiesbaden 2008

- Minto, Barbara: Das Prinzip der Pyramide: Ideen klar, verständlich und erfolgreich kommunizieren. 2005

T 5.124 Course: Process Mining [T-WIWI-109799]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101476 - Business Processes and Information Systems

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	2

Events					
ST 2025	2511204	Process Mining	2 SWS	Lecture / 🗣	Oberweis, Schreiber
ST 2025	2511205	Exercise Process Mining	1 SWS	Practice / 🗣	Oberweis, Schreiber, Rybinski
Exams					
WT 24/25	79AIFB_PM_A5	Process Mining			Oberweis
ST 2025	79AIFB_PM_C2	Process Mining (Registration until 21.07.2025)			Oberweis

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Annotation
Former name (up to winter semester 2018/1019) "Workflow Management".

Below you will find excerpts from events related to this course:

V **Process Mining** — **Lecture (V) On-Site**
2511204, SS 2025, 2 SWS, Language: German, Open in study portal

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 5.125 Course: Production and Logistics [T-WIWI-111632]

Responsible: Prof. Dr. Wolf Fichtner
Prof. Dr. Stefan Nickel
Prof. Dr. Frank Schultmann

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-105267 - Business Administration

Type	Credits	Grading scale	Recurrence	Version
Written examination	3	Grade to a third	Each winter term	1

Exams			
WT 24/25	7900231	Production and Logistics	Schultmann, Nickel, Fichtner
ST 2025	7900080	Production and Logistics	Schultmann, Nickel, Fichtner

Competence Certificate
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 5.126 Course: Production Economics and Sustainability [T-WIWI-102820]

Responsible: Prof. Dr. Frank Schultmann
Dr.-Ing. Rebekka Volk
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101437 - Industrial Production I

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2581960	Production Economics and Sustainability	2 SWS	Lecture / 🗣	Volk, Schultmann, Bischof
Exams					
WT 24/25	7981960	Production Economics and Sustainability			Schultmann

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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 events related to this course:

V Production Economics and Sustainability

2581960, WS 24/25, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content
The analysis and management of material flows on the company level and above will be the focus of this lecture. Herein, the discussion will be about cost-effective and environmentally acceptable steps to avoid, abate and recycle emissions and waste as well as ways of efficient resources handling. As methods material flow analysis (MFA), life cycle assessment (LCA) and OR methods, e.g. for decision support, are introduced.

Topics:
- regulations related to materials and substances
- raw materials, reserves and their availabilities/lifetimes
- material and substance flow analysis (MFA/SFA)
- material related ecoprofiles, e.g. Carbon Footprint
- LCA
- resource efficiency
- emission abatement
- waste management and closed-loop recycling
- raw material oriented production systems
- environmental management (EMAS, ISO 14001, Ecoprofit), eco-controlling

Organizational issues
Seminarraum Uni-West, Geb. 06.33

Literature
wird in der Veranstaltung bekannt gegeben

T 5.127 Course: Programming [T-INFO-101531]

Responsible: Prof. Dr.-Ing. Anne Koziolek
Prof. Dr. Ralf Reussner

Organisation: KIT Department of Informatics

Part of: M-WIWI-104843 - Orientation Exam
M-INFO-101174 - Programming

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	5	Grade to a third	Each winter term	1

Events					
WT 24/25	2424004	Programming	4 SWS	Lecture / Practice (	Koziolek
ST 2025	2400083	Programming Exercise	0 SWS	Practice / 🗣	Koziolek
Exams					
WT 24/25	7500075	Programming			Koziolek

Legend: 📱 Online, 🏘 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.128 Course: Programming Pass [T-INFO-101967]

Responsible: Prof. Dr.-Ing. Anne Koziolek
Prof. Dr. Ralf Reussner

Organisation: KIT Department of Informatics

Part of: M-WIWI-104843 - Orientation Exam
M-INFO-101174 - Programming

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each term	1

Events					
WT 24/25	2424004	Programming	4 SWS	Lecture / Practice (	Koziolek
ST 2025	2400083	Programming Exercise	0 SWS	Practice / 🗣	Koziolek
Exams					
WT 24/25	7500074	Programming Pass			Koziolek
ST 2025	7500022	Programming Pass			Koziolek, Reussner

Legend: 📱 Online, 🏵 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.129 Course: Project Management in Practice [T-INFO-101976]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-105589 - Introduction to Data and Information Management

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	1,5	pass/fail	Irregular	1

T 5.130 Course: Public Law I & II [T-INFO-110300]

Responsible: N.N.
Organisation: KIT Department of Informatics
Part of: M-INFO-105247 - Constitutional and Administrative Law

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

Events					
WT 24/25	2424016	Öffentliches Recht I - Grundlagen	2 SWS	Lecture / 🗣	Zufall
ST 2025	24520	Öffentliches Recht II - Öffentliches Wirtschaftsrecht	2 SWS	Lecture / 🗣	Zufall
Exams					
WT 24/25	7500138	Public Law I & II			Zufall
ST 2025	7500298	Public Law I & II			Zufall

Legend: 📱 Online, 🏵 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 5.131 Course: Public Revenues [T-WIWI-102739]

Responsible: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101668 - Economic Policy I
M-WIWI-101499 - Applied Microeconomics
M-WIWI-101403 - Public Finance

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2025	2560120	Public Revenues	2 SWS	Lecture / 🗣	Wigger
ST 2025	2560121	Übung zu Öffentliche Einnahmen	1 SWS	Practice / 🗣	Wigger, Schmelzer
Exams					
WT 24/25	790oeff	Public Revenues			Wigger
ST 2025	790oeff	Public Revenues			Wigger

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
Depending on the further pandemic development the assessment will consist either of an open book exam (following Art. 4, para. 2, clause 3 of the examination regulation), or of an 1h written exam (following Art. 4, para. 2, clause 1 of the examination regulation).

Prerequisites
None

Recommendation
Basic knowledge of Public Finance is required.

Below you will find excerpts from events related to this course:

V Public Revenues

2560120, SS 2025, 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 5.132 Course: Renewable Energy-Resources, Technologies and Economics [T-WIWI-100806]

Responsible: Prof. Dr. Patrick Jochem
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101464 - Energy Economics

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each winter term	8

Events					
WT 24/25	2581012	Renewable Energy – Resources, Technologies and Economics	2 SWS	Lecture / 🗣	Jochem
Exams					
WT 24/25	7981012	Renewable Energy-Resources, Technologies and Economics			Fichtner

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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. Depending on the respective pandemic situation, the exam may be offered as an open book exam (alternative exam assessment, following §4(2), 3 of the examination regulation).

Prerequisites
None.

Below you will find excerpts from events related to this course:

V Renewable Energy – Resources, Technologies and Economics

2581012, WS 24/25, 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.

Organizational issues
Blockveranstaltung, freitags 14:00-17:00 Uhr, 25.10., 08.11., 22.11., 06.12., 20.12., 17.01., 31.01. 14.02.

Literature
Weiterführende Literatur:

- Kaltschmitt, M., 2006, Erneuerbare Energien : Systemtechnik, Wirtschaftlichkeit, Umweltaspekte, aktualisierte, korrigierte und ergänzte Auflage Berlin, Heidelberg : Springer-Verlag Berlin Heidelberg.
- Kaltschmitt, M., Streicher, W., Wiese, A. (eds.), 2007, Renewable Energy: Technology, Economics and Environment, Springer, Heidelberg.
- Quaschning, V., 2010, Erneuerbare Energien und Klimaschutz : Hintergründe - Techniken - Anlagenplanung – Wirtschaftlichkeit München : Hanser, III.2., aktualis. Aufl.
- Harvey, D., 2010, Energy and the New Reality 2: Carbon-Free Energy Supply, Eathscan, London/Washington.
- Boyle, G. (ed.), 2004, Renewable Energy: Power for a Sustainable Future, 2nd Edition, Open University Press, Oxford.

T 5.133 Course: Robotics I - Introduction to Robotics [T-INFO-114190]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: M-INFO-107162 - Robotics I - Introduction to Robotics

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each winter term	1

Exams			
ST 2025	7500218	Robotics I - Introduction to Robotics	Asfour

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

Prerequisites
none.

T 5.134 Course: Selling IT-Solutions Professionally [T-INFO-101977]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-105589 - Introduction to Data and Information Management

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	1,5	pass/fail	Irregular	1

T 5.135 Course: Semantic Web Technologies [T-WIWI-110848]

Responsible: Dr.-Ing. Tobias Käfer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101438 - Semantic Knowledge Management

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	1

Events					
ST 2025	2511310	Semantic Web Technologies	2 SWS	Lecture / 🗣	Käfer, Braun, Kinder, Kubelka
ST 2025	2511311	Exercises to Semantic Web Technologies	1 SWS	Practice / 🗣	Käfer, Braun, Kinder
Exams					
WT 24/25	79AIFB_SWebT_A2	Semantic Web Technologies			Käfer
ST 2025	79AIFB_SWebT_A4	Semantic Web Technologies (Registration until 21.07.2025)			Käfer

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Recommendation
Lectures on Informatics of the Bachelor on Information Systems (Semester 1-4) or equivalent are required.

Below you will find excerpts from events related to this course:

V **Semantic Web Technologies** — **Lecture (V) On-Site**
2511310, SS 2025, 2 SWS, Language: English, Open in study portal

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 preperation and postprocessing: 60 hours
- Exam and exam preperation: 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.

V **Exercises to Semantic Web Technologies** **Practice (Ü) On-Site**
2511311, SS 2025, 1 SWS, Language: English, Open in study portal

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.

Organizational issues
Die Übungen finden im Rahmen der Termine der Blockvorlesung statt.

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 5.136 Course: Seminar in Business Administration (Bachelor) [T-WIWI-103486]

Responsible: Professorenschaft des Fachbereichs Betriebswirtschaftslehre
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101826 - Seminar Module Economic Sciences

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
WT 24/25	00063	Seminar Social Sentiment in Times of Crises	2 SWS	Seminar	Fegert
WT 24/25	2500006	Digital Citizen Science	2 SWS	Seminar / 🗣	Greif-Winzrieth
WT 24/25	2500045	Digital Democracy - Challenges and Opportunities of the Digital Society	2 SWS	Seminar / 🧩	Fegert, Stein, Bezzaoui, Pekkip
WT 24/25	2500061	Special Topics in Transportation Strategy	2 SWS	Seminar / 🗣	Müller
WT 24/25	2500125	Human-Centered Systems Seminar: Engineering	2 SWS	Seminar / 🧩	Mädche
WT 24/25	2500165	Student2Startup	2 SWS	Seminar / 🧩	Böhrer, Mohammadi
WT 24/25	2500215	Entrepreneurship Seasonal School	2 SWS	Block / 🗣	Weimar
WT 24/25	2530580	Seminar in Finance (Bachelor)	2 SWS	Seminar / 🗣	Uhrig-Homburg
WT 24/25	2530586			Seminar / 🗣	Uhrig-Homburg, Molnar
WT 24/25	2540473	Business Data Analytics	2 SWS	Seminar / 🗣	Grote, Schulz, Motz
WT 24/25	2540475	Positive Information Systems	2 SWS	Seminar / 🗣	Knierim, del Puppo
WT 24/25	2540478	Smart Grids and Energy Markets	2 SWS	Seminar / 🗣	Weinhardt, Semmelmann, Miskiw
WT 24/25	2540524	Bachelor Seminar in Data Science and Machine Learning	2 SWS	Seminar	Geyer-Schulz, Nazemi
WT 24/25	2540557	Human-Centered Systems Seminar: Research	2 SWS	Seminar / 🧩	Mädche
WT 24/25	2545010	Entrepreneurship Basics (Track 1)	2 SWS	Seminar / 🧩	Hirte
WT 24/25	2545011	Entrepreneurship Basics (Track 2)	2 SWS	Seminar / 🧩	Wohlfeil, Wohlfeil
WT 24/25	2571180	Seminar in Marketing and Sales (Bachelor)	2 SWS	Seminar / 🗣	Klarmann, Mitarbeiter
WT 24/25	2573010	Seminar: Human Resources and Organizations (Bachelor)	2 SWS	Seminar / 🗣	Nieken, Mitarbeiter
WT 24/25	2573011	Seminar: Human Resource Management (Bachelor)	2 SWS	Seminar / 🗣	Nieken, Mitarbeiter
WT 24/25	2579919	Seminar Management Accounting - Sustainability Topics	2 SWS	Seminar / 🗣	Wouters, Dickemann
WT 24/25	2581030	Seminar in Energy Economics	2 SWS	Seminar / 🗣	Fichtner, Sloot
WT 24/25	2581976	Seminar in Production and Operations Management I	2 SWS	Seminar / 🗣	Schultmann, Rudi
WT 24/25	2581977	Seminar in Production and Operations Management II	2 SWS	Seminar / 🗣	Volk, Schultmann
WT 24/25	2581978	Seminar in Production and Operations Management	2 SWS	Seminar / 🗣	Schultmann, Rosenberg
WT 24/25	2581979	Seminar in Energy Economics	2 SWS	Seminar / 🗣	Fichtner, Kleinebrahm
WT 24/25	2581980	Seminar in Energy Economics	2 SWS	Seminar / 🗣	Fichtner, Sandmeier
WT 24/25	2581981	Seminar in Energy Economics	2 SWS	Seminar / 🗣	Ardone, Fichtner, Slednev

ST 2025	00063	Seminar Social Sentiment in Times of Crises	2 SWS	Seminar	Fegert
ST 2025	2500020	Digital Democracy - Challenges and opportunities of the digital society	2 SWS	Seminar /	Fegert
ST 2025	2500056	ABBA Summer School Seminar: Biosignal-Adaptive GenAI Systems	2 SWS	Seminar /	Mädche
ST 2025	2500061	Special Topics in Transportation Strategy	2 SWS	Seminar /	Müller
ST 2025	2500125	Human-Centered Systems Seminar: Engineering	3 SWS	Seminar /	Mädche
ST 2025	2530293	Seminar in Finance (Bachelor, Prof. Ruckes)	2 SWS	Seminar /	Ruckes, Luedecke, Benz, Kohl, Sarac
ST 2025	2540468	Bachelor Seminar: AI-Driven Information Systems	2 SWS	Seminar /	Pfeiffer, Bennardo
ST 2025	2540473	Business Data Analytics	2 SWS	Seminar	Hariharan
ST 2025	2540475	Positive Information Systems	2 SWS	Seminar	Knierim
ST 2025	2540478	Smart Grid Economics & Energy Markets	2 SWS	Seminar	Weinhardt
ST 2025	2540524	Bachelor Seminar in Data Science and Machine Learning	2 SWS	Seminar	Geyer-Schulz
ST 2025	2540553	User-Adaptive Systems Seminar	2 SWS	Seminar /	Mädche, Beigl
ST 2025	2540557	Human-Centered Systems Seminar: Research	3 SWS	Seminar /	Mädche
ST 2025	2545010	Entrepreneurship Basics (Track 1)	2 SWS	Seminar /	Hirte, Terzidis
ST 2025	2545011	Entrepreneurship Basics (Track 2)	2 SWS	Seminar /	Wohlfeil, Terzidis
ST 2025	2571187	Seminar Digital Marketing (Bachelor)	2 SWS	Seminar /	Kupfer
ST 2025	2573010	Seminar Human Resources and Organizations (Bachelor)	2 SWS	Seminar /	Nieken, Mitarbeiter, Walther
ST 2025	2573011	Seminar Human Resource Management (Bachelor)	2 SWS	Seminar /	Nieken, Mitarbeiter, Gorny
ST 2025	2579919	Seminar Management Accounting - Sustainability Topics	2 SWS	Seminar /	Letmathe
ST 2025	2581030	Seminar Energiewirtschaft IV	2 SWS	Seminar /	Fichtner, Sloot
ST 2025	2581031	Seminar Energiewirtschaft V	2 SWS	Seminar /	Plötz
ST 2025	2581032	Seminar Energiewirtschaft VI	2 SWS	Seminar /	Slednev, Fichtner
ST 2025	2581976	Seminar Produktionswirtschaft und Logistik I	2 SWS	Seminar /	Schultmann, Rudi
ST 2025	2581977	Seminar Produktionswirtschaft und Logistik II	2 SWS	Seminar /	Volk, Schultmann
ST 2025	2581978	Seminar Produktionswirtschaft und Logistik III	2 SWS	Seminar /	Schultmann
ST 2025	2581979	Seminar Energiewirtschaft I	2 SWS	Seminar /	Fichtner, Kleinebrahm
ST 2025	2581981	Seminar Energiewirtschaft III	2 SWS	Seminar /	Ardone, Fichtner
Exams					
WT 24/25	00064	Seminar Social Sentiment in Times of Crises			Weinhardt
WT 24/25	00072	Seminar Positive Information Systems			Weinhardt
WT 24/25	00074	Seminar Business Data Analytics			Weinhardt
WT 24/25	7900017	Seminar Smart Grid and Energy Markets			Weinhardt
WT 24/25	7900069	Human-Centered Systems Seminar: Engineering			Mädche
WT 24/25	7900085	Entrepreneurship Basics (Track 1)			Terzidis
WT 24/25	7900087	Entrepreneurship Basics (Track 2)			Terzidis
WT 24/25	7900129	Special Topics in Transportation Strategy			Lindstädt
WT 24/25	7900138	Seminar in Marketing and Sales (Bachelor)			Klarmann
WT 24/25	7900146	Entrepreneurship Seasonal School			Terzidis

WT 24/25	7900157	Seminar Human Resources and Organizations (Bachelor)	Nieken
WT 24/25	7900161	Seminar Human Resource Management (Bachelor)	Nieken
WT 24/25	7900168	Bachelor Seminar in Data Science and Machine Learning	Geyer-Schulz
WT 24/25	7900175	Seminar in Finance: How Retail Investors Influence Stock Markets - The Game Stop Case	Uhrig-Homburg
WT 24/25	7900203	Seminar "Finance in a nutshell"	Uhrig-Homburg
WT 24/25	7900233	Human-Centered Systems Seminar: Research	Mädche
WT 24/25	7900309	Student2Startup	Terzidis
WT 24/25	7900335	Seminar Energy Economics IV	Fichtner
WT 24/25	79-2579919-B	Seminar Management Accounting - Sustainability Topics (Bachelor)	Wouters
WT 24/25	7981976	Seminar in Production and Operations Management I	Schultmann
WT 24/25	7981977	Seminar in Production and Operations Management II	Schultmann
WT 24/25	7981978	Seminar in Production and Operations Management III	Schultmann
WT 24/25	7981979	Seminar Energy Economics I	Fichtner
WT 24/25	7981980	Seminar Energy Economics II	Fichtner
WT 24/25	7981981	Seminar Energy Economics III	Fichtner
ST 2025	7900003	Seminar in Finance (Bachelor, Prof. Ruckes)	Ruckes
ST 2025	7900056	Entrepreneurship Basics (Track 1)	Terzidis
ST 2025	7900057	Entrepreneurship Basics (Track 2)	Terzidis
ST 2025	7900100	Seminar Human Resource Management (Bachelor)	Nieken
ST 2025	7900230	Seminar Human Resources and Organizations (Bachelor)	Nieken
ST 2025	792581030	Seminar Energy Economics IV	Fichtner
ST 2025	792581031	Seminar Energy Economics V	Plötz
ST 2025	7981976	Seminar in Production and Operations Management I	Schultmann
ST 2025	7981977	Seminar in Production and Operations Management II	Schultmann
ST 2025	7981979	Seminar Energy Economics I	Fichtner
ST 2025	7981981	Seminar Energy Economics III	Fichtner

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

Competence Certificate
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.

Recommendation
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Annotation
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 events related to this course:

Student2Startup

V

2500165, WS 24/25, 2 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content
Content:

In this seminar, five pre-seed startup projects will define strategic challenges and ask students to work on solutions. Mentors from the industry will support the teams. In addition to a kick-off and final event, we will organize regular seminar sessions to provide background and help the student teams in their tasks.

Learning Objectives:

After completing this course, the course participants will be able to

- Understand and apply basic concepts of entrepreneurship, including business modeling, lean startup approaches, and market analysis
- Work in a team, organize the division of labor into separate tasks, and coordinate the tasks to attain a result
- Understand specific challenges of startup projects
- Interact with experts from the industry and potential users to develop answers/solutions to a given challenge
- Present the results to the startups and experts from the industry

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.

Entrepreneurship Seasonal School

V

2500215, WS 24/25, 2 SWS, Language: English, Open in study portal

Block (B)
On-Site

Content
During the Entrepreneurship Seasonal School, students develop a business model based on innovative technologies and social problems in workshops in international teams for one week.

Course Content:

The Entrepreneurship Seasonal School brings together students from different universities to spend a week strengthening their knowledge of digital entrepreneurship in healthcare. Experience the life of an entrepreneur and learn how to attain resources to realize a product vision. During one week, you will develop a range of entrepreneurial competences crucial for establishing a successful venture. Our primary focus is on digital healthcare ventures, granting you the opportunity to delve into the realm of entrepreneurship within the healthcare system. By gaining a deep understanding of healthcare needs, you will utilize creativity techniques to uncover potential business ideas that provide value for patients and doctors. Additionally, you will learn how to create viable business models, dive into health regulations, and pitch your idea to a jury.

In WS 2023/24 the one-week program is being hosted by the Karlsruhe Institute of Technology, with co-teaching support from the Eucor partners University of Basel and the University of Strasbourg.

In the seminar you will work on a project in teams of max. 5 persons.

Learning Objectives:

After attending the event, you will be able to...

- describe the role of entrepreneurship
- develop innovative and technology-based solutions for societal problems,
- develop a viable business model for a problem,
- present a business idea to a panel of judges,
- and be empowered to work independently in multidisciplinary and multicultural teams

Organizational issues
Expected date: 17.02.25 – 21.02.25, Details will be announced later. Registration via wiwi portal.

V

2530586, WS 24/25, 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 21.10.24 um 16 Uhr, Zwischenpräsentation am 10.12.24, 16 Uhr und Abschlusspräsentation am 21.01.25, 17:45 Uhr am Campus B (Geb. 09.21), Raum 209

V

Business Data Analytics

2540473, WS 24/25, 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

V

Bachelor Seminar in Data Science and Machine Learning

2540524, WS 24/25, 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

V

Entrepreneurship Basics (Track 1)

2545010, WS 24/25, 2 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content
Course Content:

This seminar explains important factors for becoming an entrepreneur and guides you through a structured process from the first business idea to a pitch of your final business model. Therefore, a business idea will be developed in the context of the UN Sustainable Development Goals. In small teams you create, develop, validate and present your business model. It simulates the basics of a start-up process up to the investor pitch.

Learning Objectives

After completing this course, the course participants will be able to

- Reflect on and define your personal and team core values
- Reflect on and define your personal and team competencies
- Reflect on and recall a definition for business opportunity
- Define your field of interest for opportunity recognition using the UN SDGs
- Analyze a specific domain to identify business opportunities
- Develop a first draft for your business model by using the Business Model Canvas
- Pitch / present your business idea

Credentials:

Registration is via the Wiwi portal.

Exam:

Presentation + active participation + paper.

Target group:

Bachelor students

Organizational issues
Registration is via the Wiwi portal.

In the seminar you will work on a project in teams of max. 5 persons. The groups are formed in the seminar

V

Entrepreneurship Basics (Track 2)

2545011, WS 24/25, 2 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content
Course Content:

The seminar introduces the basics of planning and modeling of business ideas. Based on a structured process, you will be guided through the development of your own business ideas, the derivation and testing of initial business model hypotheses, and the final creation of a business plan. In small teams you will create, develop, validate and present your business model. The basic steps of a start-up process are simulated.

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:

- how business ideas are created and how they can be developed
- what the value proposition of a business idea is
- how a business model hypothesis can be generated and tested
- which successful business model patterns exist and how they can be used for one's own business
- how to pitch business ideas and convince potential investors

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 4-5 persons. The groups are formed in the seminar.

V

Seminar: Human Resources and Organizations (Bachelor)

2573010, WS 24/25, 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

V **Seminar: Human Resource Management (Bachelor)** **Seminar (S) On-Site**
2573011, WS 24/25, 2 SWS, Language: German, Open in study portal

Content
The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

Aim
The student

- looks critically into current research topics in the fields of Human Resource Management and Personnel Economics.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Workload
The total workload for this course is: approximately 90 hours.

Lecture: 30h
Preparation of lecture: 45h
Exam preparation: 15h

Literature
Selected journal articles and books.

Organizational issues
Blockveranstaltung siehe Homepage

V **Seminar Management Accounting - Sustainability Topics** **Seminar (S) On-Site**
2579919, WS 24/25, 2 SWS, Language: English, Open in study portal

Content
The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in several meetings that are spread throughout the semester.

Learning objectives:

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources.

Examination:

- The performance review is carried out in the form of a “Prüfungsleistung anderer Art” (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade is made up of the grade of the seminar paper, the presentation and the contributions in the seminar sessions.

Required prior Courses:

- The course requires a basic knowledge of finance and accounting.

Workload:

- The total workload for this course is approximately 90 hours. For further information see German version.

Note:

- Maximum of 8 students.

Organizational issues
Ort und Zeit werden noch bekannt gegeben bzw. über ILIAS

Literature
Will be announced in the course.

V **ABBA Summer School Seminar: Biosignal-Adaptive GenAI Systems** — **Seminar (S)**, **Blended (On-Site/Online)**
2500056, SS 2025, 2 SWS, Language: English, Open in study portal

Content
Background: In the ABBA Summer School Seminar hosted at the Karlsruhe Decision & Design Lab (KD²Lab) at KIT, we aim to enable students to explore biosignal sensors for designing user-adaptive systems. This comprehensive three-day program is designed for both bachelor's and master's students who want to gain an understanding of biosignal and the development of user-adaptive systems. The learning objective is to design human-centered biosignal-adaptive systems to address user needs in learning scenarios.

Course Content: Throughout the summer school, students will learn the foundations of biosignal-adaptive systems through a series of lectures and apply the knowledge in practical group work. For the group work, we offer students two contexts for their research topics: literature research during thesis writing and programming with LLM. Aiming to address user challenges in these two contexts, we provide two biosignal sensors: EEG or eye-tracking sensors. By collecting biosignal data with the sensors, we encourage students to integrate cutting-edge AI algorithms for their design and implementation. In the end, students should present their results to showcase the functionality, innovation, and a prototype of their biosignal-adaptive systems.

Learning Outcome: By successfully achieving the learning objective, students will receive a certificate from KIT and will have the opportunity to apply their acquired skills and knowledge for further research.

The seminar will be held in a three-day format from 23th to 25th September with 3 ECTS. For any questions, please ask Luke (shi.liu@kit.edu) for more information!

V **Human-Centered Systems Seminar: Engineering** — **Seminar (S)**, **Blended (On-Site/Online)**
2500125, SS 2025, 3 SWS, Language: English, Open in study portal

Content
Formerly known as "Current Topics in Digital Transformation"

With this seminar, we aim to provide students with the possibility to independently work on state-of-the-art research topics in addition to the knowledge gained in the lectures of the human-centered systems lab (Prof. Mädche). Students will work on a dedicated topic in the context of human-centered systems and apply a pre-defined research method. A broad spectrum of topics is offered every semester, topics may range from creating an experimental design, analyzing collected data, or systematically comparing existing software prototypes in a specific field of interest.

V Bachelor Seminar: AI-Driven Information Systems

2540468, SS 2025, 2 SWS, Language: English, Open in study portal

Seminar (S)
On-Site

Content
This bachelor seminar explores information systems that leverage AI algorithms from multiple perspectives: While some topics examine these systems from a managerial viewpoint, others take a design-oriented approach. For example, one topic explores how sensor data can enhance system intelligence to assist consumers during their purchasing decisions. Another investigates how collaboration in digital work is affected when intelligent assistance systems serve as fully virtual advisors. Additionally, some topics are situated in virtual reality, reflecting one of the key research areas of our research group.

This seminar is offered by the newly established Information Systems III research group headed by Prof. Dr. Jella Pfeiffer at the Institute for Information Systems (WIN). To learn more about us, please visit our website (WIN - Information Systems III).

V User-Adaptive Systems Seminar

2540553, SS 2025, 2 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content
User-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 user-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 user-adaptive system is and how it can be conceptualized
- Suggest and evaluate different design solutions for addressing the identified problem
- Build a user-adaptive system prototype using state-of-the-art hard- and software
- Perform a user-centric evaluation of the user-adaptive system prototype

Prerequisites

Strong analytical abilities and profound software development skills are required.

Organizational issues
Termine werden bekannt gegeben

Literature
Required literature will be made available in the seminar.

V Human-Centered Systems Seminar: Research

2540557, SS 2025, 3 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content
Formerly known as "Information Systems and Service Design Seminar"

With this seminar, we aim to provide students with the possibility to independently work on state-of-the-art research topics in addition to the knowledge gained in the lectures of the research group IS I (Prof. Mädche). The research group "Information Systems I" (IS I) headed by Prof. Mädche focuses in research, education, and innovation on designing interactive intelligent systems. It is positioned at the intersection of Information Systems and Human-Computer Interaction (HCI).

In the seminar, participants will get deeper insights in a contemporary research topic in the field of information systems, specifically interactive intelligent systems.

The actual seminar topics will be derived from current research activities of the research group. Our research assistants offer a rich set of topics from our research clusters (digital experience and participation, intelligent enterprise systems, or digital services design & innovation). Students can select among these topics individually depending on their personal interests. The seminar is carried out in the form of a literature-based thesis project. In the seminar, students will acquire the important methodological skills of running a systematic literature review.

Learning Objectives

- focus on a contemporary topic at the intersection of Information Systems and Human-Computer Interaction (HCI), specifically interactive intelligent systems
- carry out a structured literature search for a given topic
- aggregate the collected information in a suitable way to present and extract knowledge
- write a seminar thesis following academic writing standards
- deliver a presentation in a scientific context in front of an auditorium

Prerequisites

No specific prerequisites are required for the seminar.

Literature

Further literature will be made available in the seminar.

Organizational issues
Termine werden bekannt gegeben

V

Entrepreneurship Basics (Track 1)

2545010, SS 2025, 2 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.

V Entrepreneurship Basics (Track 2)

2545011, SS 2025, 2 SWS, Language: English, Open in study portal

Seminar (S)
On-Site

Content
Course Content:

This seminar shows what is important for entrepreneurs and it guides you through a structured process from the first business idea to a pitch of your final business model. In teams you create, develop, validate and present your business model. It partially simulates a start-up process up to the investor pitch.

Starting with a rough business idea, you learn to understand and validate the customer problems. Together with your teammates and the feedback from the other teams and the lecturer, you will create a sharp business model by using tools like the Value Proposition Canvas, the Business Model Canvas and customer interviews. With some further information about rapid prototyping and structuring a pitch and a one-pager for business angels, you will learn, how to present the developed business. This seminar is teamwork. You grow as a team, learn to communicate and to work efficient in a team so all your results (the pitch and the written outline) are presented by the team.

Learning Objectives

- Learning of entrepreneurial skills.
- Understanding of value creation importance.
- Experience on how to derive and test hypothesis.
- Transition from ideas to a business model that works.
- Leaning how to pitch and to convince investors.

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. Team applications are welcome but not a prerequisite for participation.

V Seminar Human Resources and Organizations (Bachelor)

2573010, SS 2025, 2 SWS, Language: German, Open in study portal

Seminar (S)
On-Site

Content
The topics are redefined each semester on basis of current research topics.The topics will be announced on the website of the Wiwi-Portal.

Aim

The student

- looks critically into current research topics in the fields of human resources and organizations.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Workload

The total workload for this course is: approximately 90 hours.

Lecture: 30h
Preparation of lecture: 45h
Exam preparation: 15h

Literature

Selected journal articles and books.

Organizational issues
Geb. 05.20, Raum 2A-12.1, Termine werden bekannt gegeben

V

Seminar Human Resource Management (Bachelor)

2573011, SS 2025, 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

V

Seminar Management Accounting - Sustainability Topics

2579919, SS 2025, 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.

Workload:

- The total workload for this course is approximately 90 hours. For further information see German version.

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.

Note:

- Maximum of 8 students.

Organizational issues
Geb.05.20, 2A-12.1; Termine werden bekannt gegeben

Literature
Will be announced in the course.

T 5.137 Course: Seminar in Economics (Bachelor) [T-WIWI-103487]

Responsible: Professorenschaft des Fachbereichs Volkswirtschaftslehre
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101826 - Seminar Module Economic Sciences

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
WT 24/25	2520405	Topics in Experimental Economics		Seminar / 🗣	Reiß, Peters
WT 24/25	2520561	Wirtschaftstheoretisches Seminar I (Bachelor)	2 SWS	Seminar / 🧩	Puppe, Ammann, Kretz, Okulicz
WT 24/25	2520562	Wirtschaftstheoretisches Seminar II (Bachelor)	2 SWS	Seminar / 🗣	Puppe, Ammann, Kretz
WT 24/25	2521310	Topics in Econometrics	2 SWS	Seminar	Schienle, Krüger, Rüter
WT 24/25	2560130	Seminar Public Finance	2 SWS	Seminar / 🧩	Wigger, Schmelzer
WT 24/25	2560140	Seminar Game Theory and Behavioral Economics (Bachelor)	2 SWS	Seminar / 🗣	Rau, Rosar
WT 24/25	2560141	AI and Digitization for Society (Bachelor)	2 SWS	Seminar / 🧩	Zhao
WT 24/25	2560400	Seminar in Macroeconomics I	2 SWS	Seminar / 🧩	Brumm, Pegorari, Frank
WT 24/25	2561208	Selected aspects of European transport planning and -modelling	2 SWS	Seminar	Szimba, Mitusch
ST 2025	2500009	Seminar in Economic Theory I	2 SWS	Seminar / 🗣	Ammann, Kretz, Okulicz
ST 2025	2500040	Seminar zur Bahnökonomie und -politik	2 SWS	Seminar / 🗣	Krenn, Mitusch
ST 2025	2520367	Strategische Entscheidungen	2 SWS	Seminar / 🧩	Ehrhart
ST 2025	2520535	Seminar in Economic Theory I	2 SWS	Seminar / 🗣	Ammann, Kretz, Okulicz
ST 2025	2560130	Seminar Public Finance	2 SWS	Block / 🧩	Wigger, Schmelzer
ST 2025	2560259	Organisation and Management of Development Projects	2 SWS	Seminar / 🧩	Sieber
ST 2025	2560400	Seminar in Macroeconomics I	2 SWS	Seminar / 🧩	Brumm, Kissling, Frank
ST 2025	2560401	Seminar in Macroeconomics II	2 SWS	Seminar / 🧩	Brumm, Pegorari
ST 2025	2560553	Seminar Co-opetition: A Practical Perspective on Game Theory in the Digital Economy (Bachelor)	2 SWS	Seminar / 🗣	Rosar
ST 2025	2560555	Seminar Lying and Cheating in Economic Decision Situations (Bachelor)	2 SWS	Seminar / 🗣	Rau

Exams			
WT 24/25	7900124	Seminar Game Theory and Behavioral Economics (Bachelor)	Puppe
WT 24/25	7900139	Selected Aspects of European Transport Planning and Modelling	Mitusch
WT 24/25	7900144	Topics in Econometrics	Schienle
WT 24/25	7900155	Seminar: How to Make Democracy Work? Voting Methods in Theory and Practice (Bachelor)	Puppe
WT 24/25	7900212	Seminar in Economic Policy	Ott
WT 24/25	7900278	Seminararbeit AI and Digitization for Society (Bachelor)	Puppe
WT 24/25	79100005	Topics in Experimental Economics	Reiß
WT 24/25	79sefi1	Seminar Public Finance (Bachelor)	Wigger

ST 2025	7900051	Seminar in Economic Policy	Ott
ST 2025	7900164	Seminar in Economics (Bachelor)	Mitusch

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

Competence Certificate
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.

Recommendation
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Annotation
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 events related to this course:

V **Topics in Experimental Economics** — Seminar (S), On-Site
2520405, WS 24/25, SWS, Language: German/English, Open in study portal

Organizational issues
Blockseminar; Blücherstraße 17; Termine werden separat bekannt gegeben

Literature
Als Pflichtliteratur dienen ausgewählte Paper.

V **Topics in Econometrics** — Seminar (S)
2521310, WS 24/25, 2 SWS, Language: German, Open in study portal

Organizational issues
Blockveranstaltung, Termine werden auf Homepage und über Ilias bekannt gegeben

V **Seminar Game Theory and Behavioral Economics (Bachelor)** — Seminar (S), On-Site
2560140, WS 24/25, 2 SWS, Language: English, Open in study portal

Content
For Bachelor students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Economathematics.

Objective: 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

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: 23.10.24, 14.00 - 15.30 h, Geb. 01.85, KD2 Lab (1. floor über Außentreppe), Team Room

Presentations: 13.01.2025 08.00 - 13.00 h, 01.85, KD2 Lab (1. floor über Außentreppe), Team Room

V

AI and Digitization for Society (Bachelor)

2560141, WS 24/25, 2 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

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 http://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: 23.10.2024, 11.00 - 12.00 (online)

Presentations: 17.01.2025, 08.00 - 13.00 h, Geb. 01.85, KD2Lab Team room

V

Seminar Public Finance

2560130, SS 2025, 2 SWS, Language: German, Open in study portal

Block (B)
Blended (On-Site/Online)

Content
See German version.

Organizational issues
Termine werden bekannt gegeben.

Literature
Literatur wird zu Beginn des jeweiligen Seminars vorgestellt.

V

Seminar Co-opetition: A Practical Perspective on Game Theory in the Digital Economy (Bachelor)

2560553, SS 2025, 2 SWS, Language: English, Open in study portal

Seminar (S)
On-Site

Content
Dr. Frank Rosar **SoSe 2025**

ECON – Lehrstuhl für Wirtschaftstheorie

6 Seminar Co-opetition: A Practical Perspective on Game Theory in the Digital Economy

This seminar offers an alternative perspective on game theory that is more applied, complementing the more mathematical approach taught in standard university courses (e.g., "Einführung in die Spieltheorie").

Traditional game theory focuses on abstract mathematical models. The insights from these models are useful in real-life situations, particularly in business contexts. However, strategic interactions in such contexts are often complex, and it is not always obvious what *the 'right game'* looks like. Moreover, effectively communicating game-theoretical principles to colleagues, subordinates, and stakeholders is just as important as the analysis itself.

In their 1996 book "Co-opetition", Nalebuff and Brandenburger address these issues by explaining game-theoretic principles using real-world business examples rather than mathematical models. The authors argue rigorously but *'hide'* the underlying mathematical models. While many of the book's stories now seem outdated, the lessons remain valuable for anyone interested in *applying* game theory.

6.1 Seminar Objectives

In this seminar, students will either work alone or in small groups. Each group will be assigned one chapter of the book and will address three key tasks:

1. **Presentation of Ideas**: Each group will demonstrate their understanding of the assigned chapter by clearly communicating its key insights in their own words.
2. **Application to Modern Contexts**: Each group will transfer the chapter's ideas to examples from today's digital economy, such as platform markets, AI-driven business models, digital advertising strategies, and data-driven competition.
3. **Linking to Game Theory**: Each group will demonstrate their ability to engage with academic literature by identifying literature related to their book chapter and discussing these connections.

6.2 Seminar Organization

Introductory Meeting: The seminar will start with a kick-off meeting on April 24, 2024, at 14:00. In this meeting, students will be assigned to groups and chapters of the book and receive further guidance on expectations. The meeting will last approximately one hour.

Presentations: Each group will give a 30-minute presentation, followed by a discussion, in a blocked event on June 27. Attendance at all presentations is mandatory for successful completion of the seminar.

Seminar paper: Each group must submit a 12-page seminar paper by August 3. The seminar paper is a polished version of the presentation, incorporating useful feedback from the discussion on the seminar presentation day.

For further questions, don't hesitate to get in touch with **Dr. Frank Rosar** (rosar@kit.edu).

6.3 References

Nalebuff, Barry J., Brandenburger, A. (1996). Co-opetition. Currency.

Organizational issues
Registration via WiWi-Portal

Kick-off: 24.04.2025

Presentations: 27.06.2025

V **Seminar Lying and Cheating in Economic Decision Situations (Bachelor)** — **Seminar (S) On-Site**
2560555, SS 2025, 2 SWS, Language: English, Open in study portal

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

Introduction: 23.04.2025, 14.00 - 14.45 h , KD2Lab Teamraum

Presentations: 02.07.2025, KD2Lab Teamraum

Seminar Topics in Political Economy

T 6.138 Course: Seminar in Informatics (Bachelor) [T-WIWI-103485]

Responsible: Professorenschaft des Instituts AIFB
Organisation: KIT Department of Economics and Management
Part of: M-INFO-102058 - Seminar Module Informatics

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
WT 24/25	2513200	Seminar Programming 3 (Bachelor)	2 SWS	Seminar / 🗣	Oberweis, Fritsch, Frister, Forell, Rybinski
WT 24/25	2513214	Seminar Information security and Data protection (Bachelor)	2 SWS	Seminar / 🗣	Volkamer, Raabe, Schiefer, Hennig, Werner, Ullrich
WT 24/25	2513312	Seminar Linked Data and the Semantic Web (Bachelor)	3 SWS	Seminar / 🗣	Käfer, Braun
WT 24/25	2513314	Seminar Real-World Challenges in Data Science and Analytics (Bachelor)	3 SWS	/ 🗣	Hoellig, Käfer, Thoma
WT 24/25	2513315	Seminar Real-World Challenges in Data Science and Analytics (Master)	3 SWS	/ 🗣	Hoellig, Käfer, Thoma
ST 2025	2513308	Seminar Knowledge Discovery and Data Mining (Bachelor)	2 SWS	Seminar / 🗣	Käfer, Noullet, Popovic, Qu , Shao, Kinder
ST 2025	2513310	Seminar Data Science & Real-time Big Data Analytics (Bachelor)	2 SWS	Seminar / 🗣	Käfer, Thoma, Hoellig
ST 2025	2513500	Cognitive Automobiles and Robots	2 SWS	Seminar / 🗣	Schneider, Zöllner, Daaboul
Exams					
WT 24/25	7900038	Seminar Linked Data and the Semantic Web (Bachelor)			Färber
WT 24/25	7900042	Seminar Programming 3 (Bachelor)			Oberweis
WT 24/25	7900121	Security and Privacy Awareness			Volkamer
WT 24/25	7900187	Seminar Real-World Challenges in Data Science and Analytics (Bachelor)			Färber
WT 24/25	7900284	Seminar Information Security and Data Protection (Bachelor)			Oberweis

Legend: 🖥 Online, 🖧 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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.

Recommendation
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Annotation
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 events related to this course:

V **Seminar Programming 3 (Bachelor)** — **Seminar (S) On-Site**
2513200, WS 24/25, 2 SWS, Open in study portal

Content
Registration information and the content of the seminar will be announced on the WIWI-portal. Only bachelor students are allowed to attend this seminar.

V **Seminar Linked Data and the Semantic Web (Bachelor)** — **Seminar (S) On-Site**
2513312, WS 24/25, 3 SWS, Language: German/English, Open in study portal

Content
Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this practical seminar is to build applications and devise algorithms that consume, provide, or analyse Linked Data.

The Linked Data principles are a set of practices for data publishing on the web. Linked Data builds on the web architecture and uses HTTP for data access, and RDF for describing data, thus aiming towards web-scale data integration. There is a vast amount of data available published according to those principles: recently, 4.5 billion facts have been counted with information about various domains, including music, movies, geography, natural sciences. Linked Data is also used to make web-pages machine-understandable, corresponding annotations are considered by the big search engine providers. On a smaller scale, devices on the Internet of Things can also be accessed using Linked Data which makes the unified processing of device data and data from the web easy.

In this practical seminar, students will build prototypical applications and devise algorithms that consume, provide, or analyse Linked Data. Those applications and algorithms can also extend existing applications ranging from databases to mobile apps.

For the seminar, programming skills or knowledge about web development tools/technologies are highly recommended. Basic knowledge of RDF and SPARQL are also recommended, but may be acquired during the seminar. Students will work in groups. Seminar meetings will take place as 'Block-Seminar'.

Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media

The exact dates and information for registration will be announced at the event page.

V **Seminar Real-World Challenges in Data Science and Analytics (Bachelor)** — **On-Site**
2513314, WS 24/25, 3 SWS, Language: German/English, Open in study portal

Content
In the seminar, various Real-World Challenges in Data Science and Analytics will be worked on.

During this seminar, groups of students work on a case challenge with data provided. Here, the typical process of a data science project is depicted: integration of data, analysis of these, modeling of the decisions and visualization of the results.

During the seminar, solution concepts are worked out, implemented as a software solution and presented in an intermediate and final presentation. The seminar "Real-World Challenges in Data Science and Analytics" is aimed at students in master's programs.

The exact dates and information for registration will be announced at the course page.

V **Seminar Real-World Challenges in Data Science and Analytics (Master)** — **On-Site**
2513315, WS 24/25, 3 SWS, Language: German/English, Open in study portal

Content
In the seminar, various Real-World Challenges in Data Science and Analytics will be worked on.

During this seminar, groups of students work on a case challenge with data provided. Here, the typical process of a data science project is depicted: integration of data, analysis of these, modeling of the decisions and visualization of the results.

During the seminar, solution concepts are worked out, implemented as a software solution and presented in an intermediate and final presentation. The seminar "Real-World Challenges in Data Science and Analytics" is aimed at students in master's programs.

The exact dates and information for registration will be announced at the course page.

V Seminar Knowledge Discovery and Data Mining (Bachelor)

2513308, SS 2025, 2 SWS, Language: English, Open in study portal

Seminar (S)
On-Site

Content
In this seminar different machine learning and data mining methods are implemented.

The seminar includes different methods of machine learning and data mining. Participants of the seminar should have basic knowledge of machine learning and programming skills.

Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market
- Scientific Publications

Further Information: https://aifb.kit.edu/web/Lehre/Praktikum_Knowledge_Discovery_and_Data_Science

The exact dates and information for registration will be announced at the event page.

Organizational issues
Die Anmeldung erfolgt über das WiWi-Portal https://portal.wiwi.kit.edu/ .

Literature
Detaillierte Referenzen werden zusammen mit den jeweiligenThemen angegeben. Allgemeine Hintergrundinformationen ergeben sich z.B.aus den folgenden Lehrbüchern:

- Mitchell, T.; Machine Learning
- McGraw Hill, Cook, D.J. and Holder, L.B. (Editors) Mining Graph Data, ISBN:0-471-73190-0
- Wiley, Manning, C. and Schütze, H.; Foundations of Statistical NLP, MIT Press, 1999.

V Seminar Data Science & Real-time Big Data Analytics (Bachelor)

2513310, SS 2025, 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/ .

V Cognitive Automobiles and Robots

2513500, SS 2025, 2 SWS, Language: German/English, Open in study portal

Seminar (S)
On-Site

Content
The seminar is intended as a theoretical supplement to lectures such as "Machine Learning". The theoretical basics will be deepened in the seminar. The aim of the seminar is that the participants work individually to analyze a subsystem from the field of robotics and cognitive systems using one or more procedures from the field of AI/ML.

The individual projects require the analysis of the task at hand, selection of suitable procedures, specification and theoretical evaluation of the approach taken. Finally, the chosen solution has to be documented and presented in a short presentation.

Learning objectives:

- Students can apply knowledge from the Machine Learning lecture in a selected field of current research in robotics or cognitive automobiles for theoretical analysis.
- Students can evaluate, document and present their concepts and results.

Recommendations:

Attendance of the lecture machine learning

Workload:

The workload of 3 credit points consists of the time spent on literature research and planning/specifying the proposed solution. In addition, a short report and a presentation of the work carried out will be prepared.

Organizational issues
Anmeldung und weitere Informationen sind im Wiwi-Portal zu finden.

Registration and further information can be found in the WiWi-portal.

T 6.139 Course: Seminar in Informatics (Bachelor) [T-WIWI-112836]

Responsible: Professorenschaft des Instituts AIFB
Organisation: KIT Department of Economics and Management
Part of: M-INFO-106327 - Informatics Seminar

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Exams			
WT 24/25	7900121	Security and Privacy Awareness	Volkamer

Competence Certificate
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.

Recommendation
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Annotation
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 6.140 Course: Seminar in Operations Research (Bachelor) [T-WIWI-103488]

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

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101826 - Seminar Module Economic Sciences

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
WT 24/25	2550131	Seminar on Methodical Foundations of Operations Research (B)	2 SWS	Seminar / 🗣	Stein, Beck, Schwarze
WT 24/25	2550461	Seminar on Trending Topics in Optimization and Machine Learning (Bachelor)	2 SWS	Seminar / 🧩	Rebennack, Warwicker, Kandora
WT 24/25	2550472	Seminar on Energy and Power Systems Optimization (Bachelor)	2 SWS	Seminar / 🧩	Rebennack, Warwicker, Kandora
WT 24/25	2550491	Seminar: Modern OR and Innovative Logistics	2 SWS	Seminar / 🧩	Nickel, Mitarbeiter
ST 2025	2500028	Seminar: Modern OR and Innovative Logistics	2 SWS	Seminar / 🧩	Nickel, Mitarbeiter, Pomes
ST 2025	2550131	Seminar on Methodical Foundations of Operations Research (BA)	2 SWS	Seminar / 🗣	Stein, Beck, Schwarze, Neussel
ST 2025	2550132	Seminar on Mathematical Optimization (MA)	2 SWS	Seminar / 🗣	Stein, Beck, Schwarze, Neussel
ST 2025	2550461	Seminar: Trending Topics in Machine Learning and Optimization (Bachelor)	2 SWS	Seminar / 🧩	Rebennack, Warwicker, Kandora
ST 2025	2550472	Seminar: Energy and Power Systems Optimization (Bachelor)	2 SWS	Seminar / 🧩	Rebennack, Warwicker, Kandora
ST 2025	2550491	Seminar: Modern OR and Innovative Logistics	2 SWS	Seminar / 🧩	Nickel, Mitarbeiter
Exams					
WT 24/25	7900011_WS2425	Seminar in Operations Research B (Bachelor)			Stein
WT 24/25	7900012_WS2425	Seminar in Operations Research A (Master)			Stein
WT 24/25	7900113	Seminar Trending Topics in Optimization and Machine Learning (Bachelor)			Rebennack
WT 24/25	7900313	Seminar on Power Systems Optimization (Bachelor)			Rebennack
WT 24/25	7900342	Seminar Modern OR and Innovative Logistics			Nickel
ST 2025	7900347	Seminar on Power Systems Optimization (Bachelor)			Rebennack

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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.

Recommendation
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Annotation
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 events related to this course:

V **Seminar on Methodical Foundations of Operations Research (B)** — **Seminar (S)** **On-Site**
2550131, WS 24/25, 2 SWS, Language: German, Open in study portal

Content
The seminar aims at describing, evaluating, and discussing recent as well as classical topics in continuous optimization. The focus is on the treatment of optimization models and algorithms, also with respect to their practical application.

Bachelor studenst are introduced to the style of scientific work. By focussed treatment of a scientific topic they deal with the basics of scientific investigation and reasoning.

For further development of a scientific work style, master students are particularly expected to critically question the seminar topics.

With regard to the oral presentations the students become acquainted with presentation techniques and basics of scientifc reasoning. Also rethoric abilities may be improved.

Remarks:

Attendance at all oral presentations is compulsory.

Preferably at least one module offered by the Institute of Operations Research should have been chosen before attending this seminar.

Assessment:

The assessment is composed of a 15-20 page paper as well as a 40-60 minute oral presentation according to §4(2), 3 of the examination regulation.The grade is composed of the equally weighted assessments of the paper and the oral presentation.

The seminar is appropriate for bachelor as well as for master students. Their differentiation results from different assessment criteria for the seminar paper and the oral presentation.

Workload:

The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Die Literaur und die relevanten Quellen werden gegen Ende des vorausgehenden Semesters im Wiwi-Portal und in einer Seminarvorbesprechung bekannt gegeben.

References and relevant sources are announced at the end of the preceding semester in the Wiwi-Portal and in a prepatory meeting.

V **Seminar: Modern OR and Innovative Logistics** — **Seminar (S)** **Blended (On-Site/Online)**
2550491, WS 24/25, 2 SWS, Language: German, Open in study portal

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
Anmeldezeitraum: 11.09.24 bis 30.09.24 im Wiwi Portal

Literature
Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.

V

Seminar: Modern OR and Innovative Logistics

2500028, SS 2025, 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.

V

Seminar on Methodical Foundations of Operations Research (BA)

2550131, SS 2025, 2 SWS, Language: German, Open in study portal

Seminar (S)
On-Site

Content
The seminar aims at describing, evaluating, and discussing recent as well as classical topics in continuous optimization. The focus is on the treatment of optimization models and algorithms, also with respect to their practical application.

Bachelor studenst are introduced to the style of scientific work. By focussed treatment of a scientific topic they deal with the basics of scientific investigation and reasoning.

For further development of a scientific work style, master students are particularly expected to critically question the seminar topics.

With regard to the oral presentations the students become acquainted with presentation techniques and basics of scientifc reasoning. Also rethoric abilities may be improved.

Remarks:

Attendance at all oral presentations is compulsory.

Preferably at least one module offered by the Institute of Operations Research should have been chosen before attending this seminar.

Assessment:

The assessment is composed of a 15-20 page paper as well as a 40-60 minute oral presentation according to §4(2), 3 of the examination regulation.The grade is composed of the equally weighted assessments of the paper and the oral presentation.

The seminar is appropriate for bachelor as well as for master students. Their differentiation results from different assessment criteria for the seminar paper and the oral presentation.

Workload:

The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Die Literaur und die relevanten Quellen werden gegen Ende des vorausgehenden Semesters im Wiwi-Portal und in einer Seminarvorbesprechung bekannt gegeben.

References and relevant sources are announced at the end of the preceding semester in the Wiwi-Portal and in a prepatory meeting.

V

Seminar: Modern OR and Innovative Logistics

2550491, SS 2025, 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.

The topics of the seminar will be announced at the beginning of the term in a preliminary meeting. Attendance is compulsory for the preliminary meeting as well for all seminar presentations.

Exam:

The assessment consists of a written seminar thesis of 20-25 pages and a presentation of 35-40 minutes (according to §4(2), 3 of the examination regulation).

The final mark for the seminar consists of the seminar thesis, the seminar presentation, the handout, and if applicable further material such as programming code.

The seminar can be attended both by Bachelor and Master students. A differentiation will be achieved by different valuation standards for the seminar thesis and presentation.

Requirements:

If possible, at least one module of the institute should be taken before attending the seminar.

Objectives:

The student

- illustrates and evaluates classic and current research questions in discrete optimization,
- applies optimization models and algorithms in discrete optimization, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management),
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
- acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

Organizational issues
wird auf der Homepage dol.ior.kit.edu bzw. auf dem WiWi-Portal bekannt gegeben

Literature
Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.

T 6.141 Course: Seminar in Statistics (Bachelor) [T-WIWI-103489]

Responsible: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101826 - Seminar Module Economic Sciences

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
WT 24/25	25000111	Statistics and Epidemics		Seminar / 🗣	Bracher
WT 24/25	2500018		2 SWS	Seminar / 🗣	Grothe, Kaplan, Liu
WT 24/25	2500047	Advanced Topics in Econometrics, Statistics and Data Science	2 SWS	Seminar	Schienle, Krüger, Buse, Rüter, Bracher, Sobolová
WT 24/25	2521310	Topics in Econometrics	2 SWS	Seminar	Schienle, Krüger, Rüter
ST 2025	2500208	Statistics and Large Language Models	2 SWS	Seminar	Krüger, Eberl
ST 2025	2521310	Advanced Topics in Econometrics	2 SWS	Seminar	Schienle, Buse, Rüter, Bracher, Eberl
ST 2025	2550560	Spezielle Themen zu Statistik, Datenanalyse und maschinellem Lernen	2 SWS	Seminar / 🗣	Grothe, Liu
Exams					
WT 24/25	79000111	Statistics and Epidemics			Bracher
WT 24/25	7900144	Topics in Econometrics			Schienle
WT 24/25	7900299	Seminar in Statistics (Bachelor)			Grothe

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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.

Recommendation
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Annotation
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 events related to this course:

V **Statistics and Epidemics** — **Seminar (S) On-Site**
25000111, WS 24/25, SWS, Language: English, Open in study portal

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/8223

Application time frame: July 20th, 2024 to September, 30th, 2024.

V **Advanced Topics in Econometrics, Statistics and Data Science** — **Seminar (S)**
2500047, WS 24/25, 2 SWS, Language: German/English, Open in study portal

Organizational issues
Blockveranstaltung, Termine werden bekannt gegeben

V **Topics in Econometrics** — **Seminar (S)**
2521310, WS 24/25, 2 SWS, Language: German, Open in study portal

Organizational issues
Blockveranstaltung, Termine werden auf Homepage und über Ilias bekannt gegeben

V

Advanced Topics in Econometrics

2521310, SS 2025, 2 SWS, Language: German/English, Open in study portal

Seminar (S)

Organizational issues
Blockveranstaltung, Termine werden bekannt gegeben

T 6.142 Course: Seminar Informatics [T-INFO-112835]

Responsible: Prof. Dr. Sebastian Abeck
Organisation: KIT Department of Informatics
Part of: M-INFO-106327 - Informatics Seminar

Type	Credits	Grading scale	Version
Examination of another type	3	Grade to a third	1

Events					
WT 24/25	2400072	Seminar: Service-oriented Architectures	2 SWS	Seminar / 🗣	Abeck, Schneider, Sänger
ST 2025	2400137	Embedded Machine Learning		Seminar / 🧩	Henkel, Sikal, Khdr, Ahmed, Dietrich, Demirdag, Mentzos
ST 2025	2400145	Do LLMs understand cause and effect?	2 SWS	Seminar / 🧩	Janzing
ST 2025	2400148	Embedded Security and Architectures		Seminar / 🧩	Henkel, Nassar, Khdr, Sikal, Tobar, Alsharkawy
ST 2025	24344	Advanced Methods of Information Fusion	2 SWS	Seminar / 🗣	Hanebeck, Walker
ST 2025	2500056	ABBA Summer School Seminar: Biosignal-Adaptive GenAI Systems	2 SWS	Seminar / 🧩	Mädche
ST 2025	2500125	Human-Centered Systems Seminar: Engineering	3 SWS	Seminar / 🧩	Mädche
ST 2025	2540553	User-Adaptive Systems Seminar	2 SWS	Seminar / 🧩	Mädche, Beigl
ST 2025	2540557	Human-Centered Systems Seminar: Research	3 SWS	Seminar / 🧩	Mädche
Exams					
ST 2025	7500014	Seminar: Hot Topics in Bioinformatics			Stamatakis
ST 2025	7500177	Seminar Hot Topics in Networking			Zitterbart
ST 2025	75104740	Seminar: Service-Oriented Architectures			Abeck

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Below you will find excerpts from events related to this course:

V Embedded Machine Learning

2400137, SS 2025, 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.

V

Embedded Security and Architectures

2400148, SS 2025, 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.

V **Advanced Methods of Information Fusion** — **Seminar (S)** **On-Site**
24344, SS 2025, 2 SWS, Language: German/English, Open in study portal

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.

V **ABBA Summer School Seminar: Biosignal-Adaptive GenAI Systems** — **Seminar (S)** **Blended (On-Site/Online)**
2500056, SS 2025, 2 SWS, Language: English, Open in study portal

Content
Background: In the ABBA Summer School Seminar hosted at the Karlsruhe Decision & Design Lab (KD²Lab) at KIT, we aim to enable students to explore biosignal sensors for designing user-adaptive systems. This comprehensive three-day program is designed for both bachelor's and master's students who want to gain an understanding of biosignal and the development of user-adaptive systems. The learning objective is to design human-centered biosignal-adaptive systems to address user needs in learning scenarios.

Course Content: Throughout the summer school, students will learn the foundations of biosignal-adaptive systems through a series of lectures and apply the knowledge in practical group work. For the group work, we offer students two contexts for their research topics: literature research during thesis writing and programming with LLM. Aiming to address user challenges in these two contexts, we provide two biosignal sensors: EEG or eye-tracking sensors. By collecting biosignal data with the sensors, we encourage students to integrate cutting-edge AI algorithms for their design and implementation. In the end, students should present their results to showcase the functionality, innovation, and a prototype of their biosignal-adaptive systems.

Learning Outcome: By successfully achieving the learning objective, students will receive a certificate from KIT and will have the opportunity to apply their acquired skills and knowledge for further research.

The seminar will be held in a three-day format from 23th to 25th September with 3 ECTS. For any questions, please ask Luke (shi.liu@kit.edu) for more information!

V

Human-Centered Systems Seminar: Engineering

2500125, SS 2025, 3 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content
Formerly known as "Current Topics in Digital Transformation"

With this seminar, we aim to provide students with the possibility to independently work on state-of-the-art research topics in addition to the knowledge gained in the lectures of the human-centered systems lab (Prof. Mädche). Students will work on a dedicated topic in the context of human-centered systems and apply a pre-defined research method. A broad spectrum of topics is offered every semester, topics may range from creating an experimental design, analyzing collected data, or systematically comparing existing software prototypes in a specific field of interest.

V

User-Adaptive Systems Seminar

2540553, SS 2025, 2 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content
User-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 user-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 user-adaptive system is and how it can be conceptualized
- Suggest and evaluate different design solutions for addressing the identified problem
- Build a user-adaptive system prototype using state-of-the-art hard- and software
- Perform a user-centric evaluation of the user-adaptive system prototype

Prerequisites

Strong analytical abilities and profound software development skills are required.

Organizational issues
Termine werden bekannt gegeben

Literature
Required literature will be made available in the seminar.

V

Human-Centered Systems Seminar: Research

2540557, SS 2025, 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 Course: Seminar Informatics A [T-INFO-104336]

Responsible: Prof. Dr. Sebastian Abeck
Organisation: KIT Department of Informatics
Part of: M-INFO-102058 - Seminar Module Informatics

Type	Credits	Grading scale	Version
Examination of another type	3	Grade to a third	1

Events					
WT 24/25	2400078	Seminar: Neuronale Netze und künstliche Intelligenz	2 SWS	Seminar	Waibel, Retkowski
WT 24/25	2400137	Embedded Machine Learning Seminar		Seminar /	Sikal, Ahmed, Dietrich, Demirdag, Henkel, Khdr
WT 24/25	2400148	Embedded Security and Architectures		Seminar /	Hussain, Nassar, Khdr, Gonzalez, Sikal, Henkel
WT 24/25	2424344	Advanced Methods of Information Fusion	2 SWS	Seminar /	Hanebeck, Walker
WT 24/25	2424844	Seminar: Ubiquitous Systems	2 SWS	Seminar	Beigl, Zhou, Röddiger
WT 24/25	2500125	Human-Centered Systems Seminar: Engineering	2 SWS	Seminar /	Mädche
ST 2025	2400011	Hot Topics in Bioinformatics	2 SWS	Seminar /	Stamatakis
ST 2025	2400072	Seminar: Service-oriented Architectures	2 SWS	Seminar /	Abeck, Schneider
ST 2025	2400137	Embedded Machine Learning		Seminar /	Henkel, Sikal, Khdr, Ahmed, Dietrich, Demirdag, Mentzos
ST 2025	2400145	Do LLMs understand cause and effect?	2 SWS	Seminar /	Janzing
ST 2025	2400148	Embedded Security and Architectures		Seminar /	Henkel, Nassar, Khdr, Sikal, Tobar, Alsharkawy
ST 2025	2400161	Exploring Robotics: Insights from Science Fiction, Research and Society	2 SWS	Seminar /	Bruno, Maure
ST 2025	2400210	Seminar: Critical topics in AI	2 SWS	Seminar /	Friederich, Zhou, Reiser, Torresi, Neubert, Eberhard, Schlöder
ST 2025	24344	Advanced Methods of Information Fusion	2 SWS	Seminar /	Hanebeck, Walker
ST 2025	2500056	ABBA Summer School Seminar: Biosignal-Adaptive GenAI Systems	2 SWS	Seminar /	Mädche
ST 2025	2500125	Human-Centered Systems Seminar: Engineering	3 SWS	Seminar /	Mädche
ST 2025	2540553	User-Adaptive Systems Seminar	2 SWS	Seminar /	Mädche, Beigl
ST 2025	2540557	Human-Centered Systems Seminar: Research	3 SWS	Seminar /	Mädche
Exams					
WT 24/25	7500018	Seminar Hot Topics in Networking			Zitterbart
WT 24/25	7500021	Advanced Methods of Information Fusion			Hanebeck
WT 24/25	7500175	Seminar: Energy Informatics			Hagenmeyer, Bläsius
WT 24/25	7500220	Seminar Ubiquitous Computing			Beigl
WT 24/25	7500224	Seminar: Neural Networks and Artificial Intelligence			Niehues

WT 24/25	7500267	Seminar Advanced Topics in Machine Translation	Niehues
WT 24/25	7500287	Seminar Information Systems	Böhm, Mülle, Schäfer
WT 24/25	7500346	CES - Seminar: Embedded Systems: Architectures and Technologies	Henkel
WT 24/25	7500349	CES - Seminar: Embedded Machine Learning	Henkel
WT 24/25	7900069	Human-Centered Systems Seminar: Engineering	Mädche
WT 24/25	7900233	Human-Centered Systems Seminar: Research	Mädche
ST 2025	7500014	Seminar: Hot Topics in Bioinformatics	Stamatakis
ST 2025	7500097	Seminar: Critical topics in AI	Friederich
ST 2025	7500100	Seminar Information Systems	Böhm
ST 2025	7500110	Seminar: Exploring Robotics - Insights from Science Fiction, Research and Society	Bruno
ST 2025	7500177	Seminar Hot Topics in Networking	Zitterbart
ST 2025	75104740	Seminar: Service-Oriented Architectures	Abeck

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

Competence Certificate
The examination is carried out in accordance with Section 4 (2) No. 3 SPO. The examination is carried out by preparing a written seminar paper and presenting it. An overall grade is awarded.

Below you will find excerpts from events related to this course:

V **Seminar: Neuronale Netze und künstliche Intelligenz** — **Seminar (S)**
2400078, WS 24/25, 2 SWS, Language: German/English, Open in study portal

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 **Embedded Machine Learning Seminar** — **Seminar (S)** **Blended (On-Site/Online)**
2400137, WS 24/25, SWS, Language: German/English, Open in study portal

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.

V **Embedded Security and Architectures**
2400148, WS 24/25, 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.

V **Advanced Methods of Information Fusion** — **Seminar (S) On-Site**
2424344, WS 24/25, 2 SWS, Language: German, Open in study portal

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.

V **Hot Topics in Bioinformatics** — **Seminar (S) On-Site**
2400011, SS 2025, 2 SWS, Language: English, Open in study portal

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 chose 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 second week of the summer term** on April 29 from 09:45 - 11:15 in **SR -108**.

Seminar presentations will be conducted in a single block toward the end of the semester: July 29 in room **SR 010** - exact time to be determined

V

Embedded Machine Learning

2400137, SS 2025, 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.

V

Embedded Security and Architectures

2400148, SS 2025, 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.

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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.

V

Exploring Robotics: Insights from Science Fiction, Research and Society

2400161, SS 2025, 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.).

V

Advanced Methods of Information Fusion

24344, SS 2025, 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.

V

ABBA Summer School Seminar: Biosignal-Adaptive GenAI Systems

2500056, SS 2025, 2 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content

Background: In the ABBA Summer School Seminar hosted at the Karlsruhe Decision & Design Lab (KD²Lab) at KIT, we aim to enable students to explore biosignal sensors for designing user-adaptive systems. This comprehensive three-day program is designed for both bachelor's and master's students who want to gain an understanding of biosignal and the development of user-adaptive systems. The learning objective is to design human-centered biosignal-adaptive systems to address user needs in learning scenarios.

Course Content: Throughout the summer school, students will learn the foundations of biosignal-adaptive systems through a series of lectures and apply the knowledge in practical group work. For the group work, we offer students two contexts for their research topics: literature research during thesis writing and programming with LLM. Aiming to address user challenges in these two contexts, we provide two biosignal sensors: EEG or eye-tracking sensors. By collecting biosignal data with the sensors, we encourage students to integrate cutting-edge AI algorithms for their design and implementation. In the end, students should present their results to showcase the functionality, innovation, and a prototype of their biosignal-adaptive systems.

Learning Outcome: By successfully achieving the learning objective, students will receive a certificate from KIT and will have the opportunity to apply their acquired skills and knowledge for further research.

The seminar will be held in a three-day format from 23th to 25th September with 3 ECTS. For any questions, please ask Luke (shi.liu@kit.edu) for more information!

V

Human-Centered Systems Seminar: Engineering

2500125, SS 2025, 3 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content

Formerly known as "Current Topics in Digital Transformation"

With this seminar, we aim to provide students with the possibility to independently work on state-of-the-art research topics in addition to the knowledge gained in the lectures of the human-centered systems lab (Prof. Mädche). Students will work on a dedicated topic in the context of human-centered systems and apply a pre-defined research method. A broad spectrum of topics is offered every semester, topics may range from creating an experimental design, analyzing collected data, or systematically comparing existing software prototypes in a specific field of interest.

V

User-Adaptive Systems Seminar

2540553, SS 2025, 2 SWS, Language: English, Open in study portal

Seminar (S)
Blended (On-Site/Online)

Content

User-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 user-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 user-adaptive system is and how it can be conceptualized
- Suggest and evaluate different design solutions for addressing the identified problem
- Build a user-adaptive system prototype using state-of-the-art hard- and software
- Perform a user-centric evaluation of the user-adaptive system prototype

Prerequisites

Strong analytical abilities and profound software development skills are required.

Organizational issues

Termine werden bekannt gegeben

Literature

Required literature will be made available in the seminar.

V

Human-Centered Systems Seminar: Research

2540557, SS 2025, 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 6.144 Course: Seminar: Legal Studies I [T-INFO-101997]

Responsible: N.N.
Organisation: KIT Department of Informatics
Part of: M-INFO-101218 - Seminar Module Law

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
WT 24/25	2400060	Data in Software-Intensive Technical Systems – Modeling – Analysis – Protection	2 SWS	Seminar / 🗣	Reussner, Raabe, Werner, Müller-Quade
WT 24/25	2400184	EU Digital Regulatory Framework	2 SWS	Seminar / 🗣	Zufall
WT 24/25	2400203	(Smart) City in and as a Network	2 SWS	Seminar / 🗣	Kasper
WT 24/25	2400209	Rechtliche Herausforderungen für die Europäische Datenökonomie	2 SWS	Seminar / 🗣	Sattler
WT 24/25	2400216	(Generative) KI und Recht	2 SWS	Seminar / 🧩	Boehm, Vettermann
WT 24/25	2513214	Seminar Information security and Data protection (Bachelor)	2 SWS	Seminar / 🗣	Volkamer, Raabe, Schiefer, Hennig, Werner, Ullrich
ST 2025	2400005	Governance, Risk & Compliance	2 SWS	Seminar / 🗣	Herzig, Siddiq
ST 2025	2400171	Regulating AI: from ethics to law	2 SWS	Seminar / 🗣	Gil Gasiola
ST 2025	2400177	Designing Data Governance of Digital Systems (en)	2 SWS	Seminar / 🗣	Pathak
ST 2025	2400190	EU Digital Regulatory Framework	2 SWS	Seminar / 🗣	Zufall
ST 2025	2400204	(Generative) KI und Recht	2 SWS	Seminar / 🧩	Boehm
ST 2025	2400207	Rechtlicher Rahmen für die Europäische Datenökonomie	2 SWS	Seminar / 🗣	Sattler
ST 2025	2400208	Rechtlicher Rahmen für Künstliche Intelligenz	2 SWS	Seminar / 🗣	Sattler
ST 2025	24820	Current Issues in Patent Law	2 SWS	Seminar / 🗣	Melullis
Exams					
WT 24/25	7500035	Seminar: Legal Studies II			Zufall
WT 24/25	7500182	Seminar: Legal Studies II			Boehm, Raabe, Sattler
WT 24/25	7500232	Seminar Data in Software-Intensive Technical Systems – Modeling – Analysis – Protection			Reussner
WT 24/25	7500249	Seminar: IT- Security Law			Zufall
ST 2025	7500140	Seminar: Legal Studies I			Raabe, Melullis, Boehm, Sattler
ST 2025	7500159	Seminar: Legal Studies I			Zufall
ST 2025	7500237	Seminar: Law and Legal Studies			Zufall

Legend: 🖥 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Below you will find excerpts from events related to this course:

V EU Digital Regulatory Framework

2400184, WS 24/25, 2 SWS, Language: English, Open in study portal

Seminar (S)
On-Site

Content
This class aims to provide an overview on the legal instruments forming the EU digital regulatory framework. Following its Digital Single Market Strategy, the EU has set up a new strategic programme for a "Digital Decade". Existing regulations like the General Data Protection Regulation (GDPR), or the E-Commerce Directive, are being complemented by a variety of new instruments that aim to set binding rules on online markets, to regulate data flows in various ways, but also to pioneer a legal framework on AI. Prominent instruments include the new AI Act, the Digital Services Act (DSA) and Digital Markets Act (DMA), the Data Act, Data Governance Act, or Open Data Directive.

The class will provide an overview on the existing framework: Which regulations and directives are relevant? How do they apply and interact which each other in a broader context?

Another objective is to provide students with the ability to read these legal instruments: How to access regulatory instruments that often have more than 100 pages (without having to read every single sentence)? How to gain a comprehensive, high-level understanding of the instrument? How to identify parts relevant to a particular legal problem?

The class will start with an introduction into EU law and regulatory instruments in general. Concrete guidance on reading, analysing and working with legal instruments in English will be given. Based on these instructions, students will be assigned legal instruments to present in the final unit along with a two-pages report.

Grades will be assigned based on the quality of these presentations and the report, as well as participation in the discussion (presentation: 40 %, two-pages report: 40 %, discussion: 20 %).

Organizational issues
WS 2024/25

Hierbei handelt es sich NICHT um eine Pro-Seminar, sondern um ein Seminar (aus Rechtswissenschaften).

Anmeldungen für das Seminar bitte NUR! über das WiWi-Portal!

***Für die Prüfung bitte NUR über CAS (Campus-Portal) anmelden!**

*Erläuterung: nach der für die Teilnahme am Seminar verbindlichen Teilnahme an der Einführungsveranstaltung bitte Anmeldung über das Campus-System (notwendig für die Erfassung der Note der Seminararbeit).

V **Regulating AI: from ethics to law** — **Seminar (S) On-Site**
2400171, SS 2025, 2 SWS, Language: English, Open in study portal

Content
Credit points = ECTS

3 ECTS

Language:

English

Competency Goals:

Students comprehend the role of technology regulation.

They are able to identify different types of regulation and their impact on different stakeholders.

They know the main aspects of the regulation of AI systems.

They understand the foundations of the AI Act of the EU.

They know the content of AI principles and are able to assess their implementation in specific projects.

Content:

This seminar will provide an overview of the regulation of technologies and in particular the regulation of AI systems. After an introduction to forms of regulation, students will explore the different regulatory instruments from the perspective of the consolidated principles of AI: fairness, transparency, privacy, security and accountability. This will allow students to discuss how the principles and rules governing AI can be implemented in concrete cases. The seminar will cover the following topics:

- Introduction to technology regulation
- Objectives of regulation
- Types of regulation
- Challenges in regulating new / disruptive technologies
- Specific challenges in regulating AI
- Fragmented/vertical regulation of AI
- AI Act
- AI principles: fairness, transparency, privacy, security, and accountability
- The role of principles in regulating AI
    - Dealing with principles when developing and implementing AI systems

Competency certificate:

The assessment of this course is carried out by the following aspects, which will be considered in the grading (§ 4 Abs. 2 Nr. 3 SPO): term paper (approx. 5 pages), presentation (approx. 20 min.) and discussion.

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.

Organizational issues
Anmeldungen für das Seminar bitte NUR! über das WiWi-Portal!
***Für die Prüfung bitte NUR über CAS (Campus-Portal) anmelden!**

*ErläuterungNach 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).

Blockseminar im SoSe 2025 (2 Termine): Termine und Uhrzeit:

Donnerstag, 24.04.2025, 13:30 - 17:30 Uhr

Donnerstag, 10.07.2025, 13:30 - 17:30 Uhr.

Raum: jeweils im Seminarraum Nr. 313 (Geb. 07.08)**English:**Please register for the seminar ONLY via the WiWi-Portal!
*Please register for the exam ONLY via CAS (Campus-Portal)!

*ExplanationAfter attending the introductory event, which is mandatory for participation in the seminar, please register via the campus system (necessary for recording the grade of the seminar paper).

Block seminar in summer term 2024 (2 dates):

Dates and time:

Thursday, 24th April 2025, 13:30 - 17:30 h

Thursday, 10th July 2025, 13:30 - 17:30 h.

Room:each time in seminar room no. 313 (building 07.08)

V **Designing Data Governance of Digital Systems (en)** — **Seminar (S) On-Site**
2400177, SS 2025, 2 SWS, Language: English, Open in study portal

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
Anmeldungen für das Seminar bitte NUR! über das WiWi-Portal! (Anmeldezeitraum für das Seminar: 01.03.2025 - 28.03.2025).
***Für die Prüfung bitte NUR über CAS (Campus-Portal) anmelden!**

*ErläuterungNach 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).

English: Please register for the seminar ONLY via the WiWi-Portal!
*Please register for the exam ONLY via CAS (Campus-Portal)!

*ExplanationAfter attending the introductory event, which is mandatory for participation in the seminar, please register via the campus system (necessary for recording the grade of the seminar paper).

Kick-off:

Friday, 11th April 2025: 10:00 - 12:00 h.

Room Nr. 313, building 07.08 (Vincenz-Prießnitz-Str. 3, KA)

Date for the final-presenations is not yet defined (as per 25.02.2025, sf).

V **EU Digital Regulatory Framework** — **Seminar (S) On-Site**
2400190, SS 2025, 2 SWS, Language: English, Open in study portal

Content

Note:
This class is mainly intended for Bachelor and Master students in Business Informatics and those wth Law as a minor subject, but also open interested students from other disciplines.

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 (proposal), the Digital Services Act (DSA) and Digital Markets Act (DMA), the Data Act, Data Governance Act, or Open Data Directive.

The class will provide an overview on the existing framework: Which regulations and directives are relevant? How do they apply and interact which each other in a broader context?

Another objective is to provide students with the ability to read these legal instruments: How to access regulatory instruments that often have more than 100 pages (without having to read every single sentence)? How to gain a comprehensive, high-level understanding of the instrument? How to identify parts relevant to a particular legal problem?

The class will start with an introduction into EU law and regulatory instruments in general. Concrete guidance on reading, analysing and working with legal instruments in English will be given. Based on these instructions, students will be assigned legal instruments to present in the final unit along with a two-pages report.

Grades will be assigned based on the quality of these presentations and the report, as well as participation in the discussion (presentation: 40 %, two-pages report: 40 %, discussion: 20 %).

Organizational issues

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).

Termine im SoSe **2025:**

Mittwoch, den 7. Mai 2025, 16-19 Uhr (Kick-off)

Donnerstag, den 17. Juli 2025, 14:00 - 18:00 Uhr (Präsentationen).

Raum:

jeweils im Seminarraum Nr. 313, Geb. 07.08.

English:

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 Campus System (necessary for recording the grade of the seminar papers).*

Dates in summer term 2025:

Wednesday, 7 May 2025, 16-19h (kick-off)

Thursday, 17th July 2025, 14:00 - 18:00 h (presentations).

Room:

In seminar room no. 313, building 07.08.

T 6.145 Course: Software Engineering I [T-INFO-101968]

Responsible: Prof. Dr.-Ing. Ina Schaefer
Organisation: KIT Department of Informatics
Part of: M-INFO-101175 - Software Engineering I

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

Events					
ST 2025	24518	Softwaretechnik I	4 SWS	Lecture / Practice (/ 🗣	Schaefer, Eichhorn
Exams					
WT 24/25	7500123	Software Engineering I			Schaefer
ST 2025	7500152	Software Engineering I			Schaefer

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 6.146 Course: Software Engineering I Pass [T-INFO-101995]

Responsible: Prof. Dr.-Ing. Ina Schaefer
Organisation: KIT Department of Informatics
Part of: M-INFO-101175 - Software Engineering I

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each summer term	1

Events					
ST 2025	24518	Softwaretechnik I	4 SWS	Lecture / Practice (/ 🗣	Schaefer, Eichhorn
Exams					
ST 2025	7500250	Software Engineering I Pass			Schaefer

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 6.147 Course: Software Engineering II [T-INFO-114259]

Responsible: Prof. Dr.-Ing. Anne Koziolek
Prof. Dr. Raffaela Mirandola
Prof. Dr. Ralf Reussner

Organisation: KIT Department of Informatics

Part of: M-INFO-107235 - Software Engineering II

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	1

Competence Certificate
The assessment is carried out as a written examination (§ 4 Abs. 2 No. 1 SPO) lasting 90 minutes.

Prerequisites
None.

Recommendation
The course *Software Engineering I* should already have been attended.

T 6.148 Course: Special Topics in Information Systems [T-WIWI-109940]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101434 - eBusiness and Service Management

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each term	2

Competence Certificate
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

Recommendation
None

Annotation
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 6.149 Course: Statistical Modeling of Generalized Regression Models [T-WIWI-103065]

Responsible: apl. Prof. Dr. Wolf-Dieter Heller
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-105414 - Statistics and Econometrics II
M-WIWI-101599 - Statistics and Econometrics

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each winter term	1

Events					
WT 24/25	2521350	Statistical Modeling of Generalized Regression Models	2 SWS	Lecture	Heller
Exams					
WT 24/25	7900011	Statistical Modeling of Generalized Regression Models			Heller
WT 24/25	7900146 (WS23/24)	Statistical Modeling of generalized regression models			Heller

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation.

Prerequisites
None

Recommendation
Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics" [2520016]

Below you will find excerpts from events related to this course:

V Statistical Modeling of Generalized Regression Models

2521350, WS 24/25, 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 6.150 Course: Statistics I [T-WIWI-102737]

Responsible: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101432 - Introduction to Statistics

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each summer term	1

Events					
ST 2025	2600008	Statistics I	4 SWS	Lecture / 🗣	Krüger
ST 2025	2600009	Tutorien zu Statistik I	2 SWS	Tutorial (	Krüger, Becker, N.N., Biegert
Exams					
WT 24/25	7900022	Statistics I			Grothe, Lerch
ST 2025	7900104	Statistics I			Krüger, Lerch

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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 events related to this course:

V Statistics I

2600008, SS 2025, 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 6.151 Course: Statistics II [T-WIWI-102738]

Responsible: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101432 - Introduction to Statistics

Type	Credits	Grading scale	Recurrence	Version
Written examination	5	Grade to a third	Each winter term	1

Events					
WT 24/25	2610020	Statistics II	4 SWS	Lecture / 🗣	Schienle
WT 24/25	2610021		2 SWS	Tutorial (	Krüger, Lerch, Becker
WT 24/25	2610022	PC-Praktikum zu Statistik II	2 SWS		Grothe, Lerch
Exams					
WT 24/25	7900001	Statistics II			Schienle, Lerch
ST 2025	7900082	Statistics II			Schienle, Lerch

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Recommendation
It ist recommended to attend the course *Statistics I* [2600008] before the course *Statistics II* [2610020].

Below you will find excerpts from events related to this course:

V Statistics II

2610020, WS 24/25, 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 parametrical mathematical statistics.

Content:

D. Sampling and Estimation Theory: Sampling distributions, estimators, point and interval estimation
E. Test Theory: General Principles of Hypothesis Testing, Concrete 1- and 2-Sampling Tests
F. Regression analysis: Simple and multiple linear regression, statistical inference

Requirements:

It ist recommended to attend the course *Statistics I* [2600008] before the course *Statistics II* [2600020].

Workload:

Total workload: 150 hours (5.0 Credits).

Attendance: 30 hours

Preparation and follow-up: 90 hours

Literature
Skriptum: Kurzfassung Statistik II

Weiterführende Literatur:

Bamberg, G., Baur, F. und Krapp, M.: Statistik, 15. überarb. Auflage. Oldenbourg, München 2009, ISBN 978-3486590883.

Fahrmeir, L., Heumann, C., Künstler, R., Pigeot, I. und Tutz, G.: Statistik - Der Weg zur Datenanalyse, 8. Auflage. Springer Spektrum. Berlin 2016, ISBN 978-3-662-50371-3.

Mosler, K. und Schmid, F.: Beschreibende Statistik und Wirtschaftsstatistik, 4. akt. und verb. Auflage, Springer, Berlin 2009, ISBN 978-3642015564.

Mosler, K. und Schmid, F.: Wahrscheinlichkeitsrechnung und schließende Statistik, 4. verb. Aufl., Springer, Berlin 2011, ISBN 978-3642150098.

Stock, J.H. und Watson M.W.: Introduction to Econometrics, 3. Auflage, Prentice Hall 2014, ISBN 978-1292071312

Stocker, T.C. und Steinke I.: Statistik: Grundlagen und Methodik. De Gruyter Oldenbourg, Berlin 2016 ISBN-13: 978-3110353884.

T 6.152 Course: Strategic Management [T-WIWI-113090]

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101425 - Strategy and Organization

Type	Credits	Grading scale	Recurrence	Version
Written examination	3,5	Grade to a third	Each summer term	1

Events					
ST 2025	2577900	Strategic Management	2 SWS	Lecture / 🗣	Lindstädt
Exams					
WT 24/25	7900199	Strategic Management			Lindstädt
ST 2025	7900067	Strategic Management			Lindstädt

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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

Below you will find excerpts from events related to this course:

V Strategic Management

2577900, SS 2025, 2 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

Students learn central concepts of strategic management along the ideal-typical strategy process. An overview of fundamental frameworks and models will be provided and an action-oriented integration performance will be achieved through the transfer of theory to practical issues.

Through intensive exposure to real-world case studies, students will be encouraged to learn and apply strategic measures in a targeted manner in the real business world. 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:

- Corporate governance and strategic management: concepts, levels, process.
- Strategic analysis: internal and external analysis
- Competitive strategy: formulation, evaluation and selection of strategic action alternatives at business unit level
- Strategic interaction and strategic commitment
- Corporate strategy: diversification strategy, M&A and management of the corporate portfolio
- Implementation of strategies in companies

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,

- Prepare strategic decisions along the ideal strategic process in a practical setting,
- Identify sources of competitive advantage,
- Explain interrelationships of companies in competition,
- Evaluate the portfolio management of companies,
- To classify actions and decisions of companies strategically,
- Apply knowledge from theoretical frameworks to the analysis of real-life situations.

Recommendations:

None.

Workload:

Total workload for 3.5 credit hours: approximately 105 hours.

Attendance: 30 hours

Self-study: 75 hours

Verification:

Depending on further pandemic developments, the examination will be offered in the summer semester 2021 either as an open-book examination (examination performance of another kind according to SPO § 4 Abs. 2, Pkt. 3), or as a 60-minute written examination (written examination according to SPO § 4 Abs. 2, Pkt. 1).

It is expected that the exam will take place at the beginning of the semester's lecture-free period.

The examination is offered every semester and can be repeated at any regular examination date.

Literature

- Pidun, U.: *Corporate Strategy: Theory and Practice*. Springer-Gabler, Wiesbaden 2019.
- Lindstädt, H.; Hauser, R.: *Strategische Wirkungsbereiche des Unternehmens*. Gabler, Wiesbaden 2004.
- Grant, R.M.: *Contemporary Strategy Analysis, 10. Aufl., Wiley 2018*.

Die relevanten Auszüge und zusätzliche Quellen werden in der Veranstaltung bekannt gegeben.

T 6.153 Course: Supplement Applied Informatics [T-WIWI-110711]

Responsible: Professorenschaft des Instituts AIFB
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101476 - Business Processes and Information Systems

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each term	1

Competence Certificate
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

Annotation
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 6.154 Course: Surfaces for Computer aided Design [T-INFO-102073]

Responsible: Prof. Dr. Hartmut Prautzsch
Organisation: KIT Department of Informatics
Part of: M-INFO-101254 - Surfaces for Computer Aided Design

Type	Credits	Grading scale	Recurrence	Version
Oral examination	5	Grade to a third	Irregular	1

T 6.155 Course: Tactical and Operational Supply Chain Management [T-WIWI-102714]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103278 - Optimization under Uncertainty
M-WIWI-101421 - Supply Chain Management
M-WIWI-101413 - Applications of Operations Research

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	Each summer term	3

Events					
ST 2025	2550486	Tactical and operational SCM	3 SWS	Lecture / 🗣	Nickel
ST 2025	2550487	Übungen zu Taktisches und operatives SCM	1.5 SWS	Practice / 🗣	Pomes, Hoffmann
Exams					
WT 24/25	7900104	Tactical and Operational Supply Chain Management			Nickel

Legend: 💻 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
Depending on further pandemic developments, the exam will be offered either as an open-book exam, or as a written exam (60 min).

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 succesful completion of the online assessments.

Recommendation
None

Annotation
The lecture is held in every summer term. The planned lectures and courses for the next three years are announced online.

Below you will find excerpts from events related to this course:

V Tactical and operational SCM

2550486, SS 2025, 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 6.156 Course: Team Project Software Development [T-INFO-109823]

Responsible: Prof. Dr. Sebastian Abeck
Prof. Dr. Ralf Reussner
Organisation: KIT Department of Informatics
Part of: M-INFO-104809 - Team Project Software Development

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	8	Grade to a third	Each term	2

Events					
WT 24/25	2400101	Team Project Software Development	2 SWS	Practical course / 🗣	Abeck, Reussner, Burger, Oberweis, Mädche, Scheibehenne
ST 2025	2424901	Team Project Software Development	2 SWS	Practical course / 🗣	Abeck, Reussner
Exams					
WT 24/25	7500150	Team Project Software Development: Write Your Own Android App			Koziolek
WT 24/25	7500317	Team Project Software Development: Data-Driven Decision-Making on Strategic Business Questions			Abeck
WT 24/25	7900193	Team Project Software Development: E-assessment for UML class diagrams			Oberweis
WT 24/25	7900235	Team Project Software Development: Fitness Analytics: Data Richness in the gym of the Future			Scheibehenne
WT 24/25	7900262	Team Project Software Development – Scenario Generation Framework for Carla			Zöllner
WT 24/25	7900308	Team Project Software Development: MyLoad, Development of a real-time visualization for cognitive load in the hybrid workplace			Mädche
WT 24/25	7900312	Team Project Software Development: Developing a web-based reading assistent using eye-tracking and LLMs			Mädche
WT 24/25	7900336	Team Project Software Development: Development of an LLM-Supported Social Robot for Mental Health Support			Mädche
WT 24/25	7900337	Team Project Software Development: Development of a Multilingual LLM-Supported Mobile Learning Assistant for Lecture Content			Mädche
WT 24/25	7900350	Team Project Software Development – Connection of Autoware to CARLA			Zöllner
WT 24/25	7900363	Team Project Software Development: Supporting emotional competence through smartwatches: Development of watchface complications, emotion recognition and micro-interventions			Mädche

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 6.157 Course: Telematics [T-INFO-114269]

Responsible: Prof. Dr. Martina Zitterbart
Organisation: KIT Department of Informatics
Part of: M-INFO-107243 - Telematics

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each winter term	1

Exams			
ST 2025	7500115	Telematics	Zitterbart

Competence Certificate
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 the form of an oral examination of approx.

- 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

takes place.

Prerequisites
None.

Recommendation

- 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.

T 6.158 Course: Theoretical Foundations of Computer Science [T-INFO-103235]

Responsible: Prof. Dr.-Ing. Marvin Künnemann
Dr. rer. nat. Torsten Ueckerdt

Organisation: KIT Department of Informatics

Part of: M-INFO-101189 - Theoretical Informatics

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each winter term	1

Events					
WT 24/25	2424005	Theoretical Foundations of Computer Science		Lecture / Practice (/ 🗣	Künnemann, Gokaj, Stieß
Exams					
WT 24/25	7500251	Theoretical Foundations of Computer Science			Künnemann

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 6.159 Course: Topics in Human Resource Management [T-WIWI-111858]

Responsible: Prof. Dr. Petra Nieken
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-106860 - Leadership & Sustainable HR-Management
M-WIWI-105928 - HR Management & Digital Workplace

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	3	Grade to a third	Each term	1

Events					
WT 24/25	2573015	Topics in Human Resource Management	2 SWS	Colloquium (K / 🗣	Nieken
ST 2025	2573015	Topics in Human Resource Management	2 SWS	Colloquium (K / 🗣	Nieken, Mitarbeiter

Legend: 📱 Online, ⛐ Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
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".

Recommendation
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 events related to this course:

V **Topics in Human Resource Management**
2573015, WS 24/25, 2 SWS, Language: German, Open in study portal
Colloquium (KOL)
On-Site

Content
The students will discuss and analyze selected research papers in the areas HRM, personnel economics, and leadership. The students will present research papers and discuss research methods and designs as well as content.

Aim

The student

- Looks into current research topics in the areas HRM, personnel economics, and leadership.
- Analyzes research papers in detail and evaluates the research outcomes.
- Trains their presentation skills.
- Learns to critically evaluate research methods and trains the scientific discussion culture.
- Gains deeper knowledge in the area of HRM.
- Learns to evaluate research designs and takes into account the ethical dimension of research.

Notes

Due to the interactive nature of the course, the number of participants is limited. If you are interested, please contact Prof. Nieken by email.

Workload

The total workload for this course is approximately 90 hours.

Lecture: 30 hours

Preparation: 45 hours

Exam preparation: 15 hours

Literature

Selected research papers

Organizational issues
Die Veranstaltung findet als Blockveranstaltung statt. Termine werden noch bekannt gegeben.

V

Topics in Human Resource Management

2573015, SS 2025, 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-12.1

T 6.160 Course: Web Applications and Service-Oriented Architectures (I) [T-INFO-103122]

Responsible: Prof. Dr. Sebastian Abeck
Organisation: KIT Department of Informatics
Part of: M-INFO-101636 - Web Applications and Service-Oriented Architectures (I)

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4	Grade to a third	Each winter term	1

Events					
WT 24/25	2424153	Web Applications and Service-oriented Architectures (I)	2 SWS	Lecture / 🗣	Abeck, Schneider, Sänger, Throner
Exams					
WT 24/25	7500026	Web Applications and Service-oriented Architectures (I)			Abeck

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

T 6.161 Course: Welfare Economics [T-WIWI-102610]

Responsible: Prof. Dr. Clemens Puppe
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101501 - Economic Theory

Type	Credits	Grading scale	Recurrence	Version
Written examination	4,5	Grade to a third	see Annotations	3

Events					
ST 2025	2520517	Welfare Economics	2 SWS	Lecture / 🗣	Puppe
ST 2025	2520518	Übung zur Wohlfahrtstheorie	1 SWS	Practice / 🗣	Puppe, Ammann
Exams					
ST 2025	7900257	Welfare Economics			Puppe

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🗣 On-Site, ✕ Cancelled

Competence Certificate
The assessment consists of a written exam (60 min.).

Prerequisites
The course *Economics I: Microeconomics* [2610012] has to be completed beforehand.

Recommendation
None

Annotation
The course only takes place every second summer semester, the next course is planned for summer semester 2025.

Below you will find excerpts from events related to this course:

V **Welfare Economics** — **Lecture (V) On-Site**
2520517, SS 2025, 2 SWS, Language: German, Open in study portal

Content
The lecture "Welfare economics" deals with the question of efficiency and distributional properties of economic allocations. The lecture covers different fairness concepts for the evaluation of economic allocations as well as the corresponding allocation mechanisms.

The first part of the lecture focuses on the efficiency and fairness of market equilibria. The two welfare theorems form the starting point of the first part: The 1st welfare theorem states that (under weak conditions) every competitive equilibrium is efficient. Conversely, according to the second welfare theorem (under stronger conditions), any efficient allocation can be obtained as a competitive equilibrium by choosing the appropriate initial endowment. Subsequently, concepts of fairness such as envy freeness, egalitarian equivalence, and others are defined and discussed in the context of general equilibrium theory.

The second part of the lecture deals with the efficiency and fairness of allocations that are the result of collective decisions. To this end, the concepts of the social welfare function and the social welfare functional are first introduced. In this part, special attention is paid to Arrow's famous impossibility theorem and the concept of axiomatic bargaining.

The third part of the lecture deals with the principle of "social justice" (i.e. distributional justice). The fundamental principles of Rawl's theory of justice, John Roemer's theory of equality of opportunity and other theories are explained and critically analyzed.

Learning objectives:
The student should learn

- to name different ideas of fairness and define them formally in mathematical terms.
- to determine efficient and fair allocations in the context of market equilibria and social welfare functionals.
- to describe, explain, and prove the interrelationships between the different ideas of fairness and efficiency in the context of market equilibria and social welfare functionals.
- to assess and discuss real economic allocations with regard to different ideas of fairness.

Workload:
Total workload for 4.5 credit points: approx. 135 hours
Attendance: 30 hours
Self-study: 105 hours

Literature

- Rawls, J. 1971. *A Theory of Justice*. Harvard University Press.
- Roemer, J. 1996. *Theories of Distributive Justice*. Harvard University Press.

7 Appendix

7.1 Definition - About this MHB

Basically, the program is divided into **subjects** (for example business administration, informatics or operations research). Each subject is in turn divided into **modules**. Each module consists of one or more interrelated **partial achievements**, which are completed by a **performance assessment**. The scope of each module is characterized by credit points, which are credited after successful completion of the module. Some modules are **compulsory**. Numerous modules offer numerous individual **elective and specialization options**. This gives students the opportunity to tailor the interdisciplinary degree program to their personal needs, interests and career prospects, both in terms of content and time. The module handbook describes the modules belonging to the degree program. It deals with

- the composition of the modules,
- the size of the modules (in CP),
- the interdependencies between the modules
- the qualification objectives of the modules,
- the type of assessment and
- how the grade of a module is calculated.

The module handbook thus provides the necessary orientation during your studies and is a helpful companion. However, the module handbook does not replace the **course catalog** which provides up-to-date information on the variable course dates (e.g. time and location of the course) for each semester.