Module Handbook
Information Engineering and Management B.Sc.

SPO 2015

Summer term 2021

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KIT DEPARTMENT OF ECONOMICS AND MANAGEMENT / KIT DEPARTMENT OF INFORMATICS

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1 General information

Welcome to the new module handbook of your study program! We are delighted that you have decided to study at the KIT Department of Economics and Management and wish you a good start into the new semester! In the following we would like to give you a short introduction to the most important terms and rules that are important in connection with the choice of modules, courses and examinations.

1.1 Structural elements

The program exists of several **subjects** (e.g. business administration, economics, operations research). Every subject is split into **modules** and every module itself consists of one or more interrelated **module component exams**. The extent of every module is indicated by credit points (CP), which will be credited after the successful completion of the module. Some of the modules are **obligatory**. According to the interdisciplinary character of the program, a great variety of **individual specialization and deepening possibilities** exists for a large number of modules. This enables the student to customize content and time schedule of the program according to personal needs, interest and job perspective. The **module handbook** describes the modules belonging to the program. It describes particularly:

- the structure of the modules
- the extent (in CP),
- the dependencies of the modules,
- the learning outcomes,
- the assessment and examinations.

The module handbook serves as a necessary orientation and as a helpful guide throughout the studies. The module handbook does not replace the **course catalog**, which provides important information concerning each semester and variable course details (e.g. time and location of the course).

1.2 Begin and completion of a module

Each module and each examination can only be selected once. The decision on the assignment of an examination to a module (if, for example, an examination in several modules is selectable) is made by the student at the moment when he / she is registered for the appropriate examination. A module is completed or passed when the module examination is passed (grade 4.0 or better). For modules in which the module examination is carried out over several partial examinations, the following applies: The module is completed when all necessary module partial examinations have been passed. In the case of modules which offer alternative partial examinations, the module examination is concluded with the examination with which the required total credit points are reached or exceeded. The module grade, however, is combined with the weight of the predefined credit points for the module in the overall grade calculation.

1.3 Module versions

It is not uncommon for modules to be revised due to, for example, new courses or cancelled examinations. As a rule, a new module version is created, which applies to all students who are new to the module. On the other hand, students who have already started the module enjoy confidence and remain in the old module version. These students can complete the module on the same conditions as at the beginning of the module (exceptions are regulated by the examination committee). The date of the student's "`binding declaration"' on the choice of the module in the sense of §5(2) of the Study and Examination Regulation is decisive. This binding declaration is made by registering for the first examination in this module.

In the module handbook, all modules are presented in their current version. The version number is given in the module description. Older module versions can be accessed via the previous module handbooks in the archive at http://www.wiwi.kit.edu/Archiv_MHB.php.

1.4 General and partial examinations

Module examinations can be either taken in a general examination or in partial examinations. If the module examination is offered as a general examination, the entire learning content of the module will be examined in a single examamination. If the module examination is subdivided into partial examinations, the content of each course will be examined in corresponding partial examinations. Registration for examinations can be done online at the campus management portal. The following functions can be accessed on https://campus.studium.kit.edu/:

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

For further and more detailed information, https://studium.kit.edu/Seiten/FAQ.aspx.

1.5 Types of exams

Exams are split into written exams, oral exams and alternative exam assessments. Exams are always graded. Non exam assessments can be repeated several times and are not graded.

Caution: exam type dependent on further pandemic developments

Due to the current situation, online formats are also available for examinations that are typically offered as **presence examinations**, depending on the circumstances.

All assessments that are announced in the modules as a written exam (written exam/sP according to SPO § 4 Abs. 2, Pkt. 1) can therefore also be offered as an alternative exam assessment/PLaA (according to SPO § 4 Abs. 2, Pkt. 3) depending on further pandemic developments. And vice versa. As alternative examination formats, **a) online examinations with video supervision** (sP) and optionally a face-to-face examination in the same examination period are offered. Or **b)** the **Online Open Book exam** (PLaA) format.

This option applies to all modules and assessments listed in the module handbook, regardless of whether or not corresponding references are already made to them there. It is also at the discretion of the responsible examiners whether they allow a 'free shot' for their examination when determining the type of examination.

1.6 Repeating exams

Principally, a failed written exam, oral exam or alternative exam assessment can repeated only once. If the repeat examination (including an eventually provided verbal repeat examination) will be failed as well, the examination claim is lost. A request for a second repetition has to be made in written form to the examination committee two months after loosing the examination claim. A counseling interview is mandatory.

For further information see http://www.wiwi.kit.edu/hinweiseZweitwdh.php.

1.7 Examiners

The examination committee has appointed the KIT examiners and lecturers listed in the module handbook for the modules and their courses as examiners for the courses they offer.

1.8 Additional accomplishments

Additional accomplishments are voluntarily taken exams, which have no impact on the overall grade of the student and can take place on the level of single courses or on entire modules. It is also mandatory to declare an additional accomplishment as such at the time of registration for an exam. Additional accomplishments with at most 30 CP may appear additionally in the certificate.

1.9 Further information

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

Information around the legal and official framework of the study program can be found in the respective study and examination regulations of your study program. These are available under the Official Announcements of KIT (http://www.sle.kit.edu/amtlicheBekanntmachungen.php).

More detailed information about the legal and general conditions of the program can be found in the examination regulation of the program (http://www.sle.kit.edu/amtlicheBekanntmachungen.php).

2 The Bachelor's degree program in Information Engineering and Management

2.1 Qualification objectives of the Bachelor's degree in Information Engineering and Management

Graduates with a Bachelor's degree in Information Engineering and Management are equipped with strategically oriented basic knowledge in the fields of informatics (theoretical computer science, algorithms, programming technology and software engineering), economic sciences (business-related topics from the financial industry, information industry, production management, marketing and accounting as well as economic correlations of microeconomics) and law (basics of private law, private business law and of the constitutional and administrative law) as well as mathemaatics, statistics and operation research.

Through the comprehensive methodological basis, the graduates are in a position to acknowledge and apply specialized basic concepts, methods, models and approaches.

The graduates have an in-depth knowledge in computer science and law.

They can acknowledge, describe and communicate economic, IT and legal problems. This hereby entails planning, analyzing, comparing, reviewing and optimizing products, systems and processes. They make decisions, develop specialized solutions and implement their innovative ideas using methods and models from different disciplines within the framework of the available resources. They know how to illustrate, validate, review and guarantee the quality of the results achieved.

The practical use of their know-how also takes into account the social, scientific and ethical aspects.

Through the interdisciplinary nature of the course, the graduates can effectively respond at the interface of the different topics as well as set up targeted communication between the respective disciplines.

The graduates are in a position to work in a team and cope with challenges, e.g., those encountered in information and communication technology fields.

They have the ability to exercise career-related activities in the industry, service sector or in trade, start their own firms or take up a Master's degree program in Information Engineering and Management or any other related course.

2.2 Structure of the Bachelor's degree program in Information Engineering and Management SPO 2015

The Bachelor's degree program in **Information Engineering and Management** SPO 2015 has 6 terms. The first four terms have a methodological orientation and provides the student with the foundations of informatics, business administration, economics and law. Terms 5 and 6 aim at the specialization and application of this knowledge. Figure 2 shows the structure of the subjects and the credits (CP) allocated to the subjects.

According to the European Credit Transfer System, one credit corresponds to a workload of 30 hours.

Figure 2: Structure of Bachelor's degree program in Information Engineering and Management SPO2015 (recommendation)

Based on a solid mathematical education, the modules of the first four terms of the Bachelor programme in information engineering and management are allocated in the proportion 40/40/20 to informatics (informatics, applied informatics, and computer engineering), economic sciences (business administration, economics, operations research), and law. The internship prepares the student for his profession. Figure 3 shows the allocation of courses to modules and the curriculum for the first four terms.

ModulID	Course	Hours per week	CP
1st Term			
M-WIWI-101491	Business Administration: Finance and Accounting	2/0/2	4.0
M-WIWI-101431	Economics I	3/0/2	5.0
M-MATH-101311	Mathematics I	4/2/2	8.0
M-INFO-101170	Basic Notions of Computer Science	3/1/3	6.0
M-INFO-101174	Programming	2/0/2	5.0
M-INFO-101190	Civil Law for Beginners	4/0	4.0
			32.0
2nd Term			
M-WIWI-101491	Introduction to Information Engineering and Management	2/0/2	4.0
M-WIWI-101432	Statistics I	4/0/2	5.0
M-WIWI-101418	Introduction to Operations Research I	2/2/2	4.5
M-MATH-101312	Mathematics II	4/2/2	8.0
M-INFO-100030	Algorithms I	3/1/2	6.0
M-INFO-101191	Advanced Civil Law	2/0	3.0
			30.5
3rd Term			
M-WIWI-101492	Financial Accounting and Cost Accounting	2/2	4.0
M-WIWI-101432	Statistics II	4/0/2	5.0
M-WIWI-101418	Introduction to Operations Research II	2/2/2	4.5
M-INFO-101189	Theoretical Foundation of Computer Science	3/1/2	6.0
M-WIWI-101430	Applied Informatics I	2/1	4.0
M-INFO-101191	Commercial and Corporate Law	2/0	3.0
M-INFO-101192	Public Law I	2/0	3.0
			29.5
4th Term			
M-WIWI-101492	Business Administration: Production Economics and Marketing	2/0/2	4.0
M-WIWI-101430	Applied Informatics II	2/1/1	4.0
M-INFO-101175	Software Engineering I	3/1/2	6.0
M-INFO-101192	Public Law II	2/0	3.0
M-INFO-101191	Exercises in Civil Law	2/2/0	3.0
M-WIWI-101433	Internship		8.0
			28.0
			120.0

Figure 3: Curriculum in the terms 1-4

In the 3rd year (5th and 6th term) of the Bachelor program the student must pass

- module(s) with 18 credits in informatics
- a module with 9 credits in the subject Business Administration
- a module with 9 credits in the subject BA/OR/EC,
- a module with 6 credits in law,

- two out of the three seminar modules with 3 credits each,
- and the bachelor thesis with 12 credits.

3 Field of study structure

Mandatory	
Orientation Exam *This field will not influence the calculated grade of its parent.*	
Bachelor Thesis	12 CR
Internship	8 CR
Business Administration	16 CR
Economics	5 CR
Informatics	37 CR
Mathematics	16 CR
Operations Research	9 CR
Statistics	10 CR
Law	19 CR
Advanced Studies in Informatics	18 CR
Advanced Studies in Economics and Management	18 CR
Advanced Studies in Law	6 CR
Research Course	6 CR

3.1 Orientation Exam

Mandatory		
M-WIWI-101528	Orientation Exam	0 CR

3.2 Bachelor Thesis

Credits 12

Mandatory		
M-WIWI-101611	Module Bachelor Thesis	12 CR

3.3 Internship

Credits 8

Mandatory		
M-WIWI-101433	Internship	8 CR

3.4 Business Administration

Credits 16

Mandatory		
M-WIWI-101491	Foundations in Business Administration	8 CR
M-WIWI-101492	Business Administration	8 CR

3.5 Economics

Credits
5

Mandatory		
M-WIWI-101431	Economics	5 CR

3.6 Informatics

Credits
37

Mandatory		
M-INFO-101170	Basic Notions of Computer Science	6 CR
M-INFO-101174	Programming	5 CR
M-INFO-100030	Algorithms I	6 CR
M-WIWI-101430	Applied Informatics	8 CR
M-INFO-101189	Theoretical Informatics	6 CR
M-INFO-101175	Software Engineering I	6 CR

3.7 Mathematics

Credits
16

Mandatory		
M-MATH-101311	Mathematics I	8 CR
M-MATH-101312	Mathematics II	8 CR

3.8 Operations Research

Credits
9

Mandatory		
M-WIWI-101418	Introduction to Operations Research	9 CR

3.9 Statistics

Credits
10

Mandatory		
M-WIWI-101432	Introduction to Statistics	10 CR

3.10 Law

Credits
19

Mandatory		
M-INFO-101190	Introduction to Civil Law	5 CR
M-INFO-101191	Commercial Law	9 CR
M-INFO-101192	Constitutional and Administrative Law	6 CR

Prerequisites
xxx

3.11 Advanced Studies in Informatics

Credits
18

Election block: Advanced Optional Courses (at least 1 item as well as at least 18 credits)		
M-INFO-101173	Algorithms II	6 CR
M-INFO-101220	Algorithms for Planar Graphs	5 CR
M-INFO-101237	Algorithmic Methods for Hard Optimization Problems	5 CR
M-INFO-101184	Mobile Robots – Practical Course	4 CR
M-INFO-101229	Database Systems in Theory and Practice	9 CR
M-INFO-102978	Digital Circuits Design	6 CR
M-INFO-100799	Formal Systems	6 CR
M-INFO-100809	Advanced Object Orientation	5 CR
M-WIWI-101476	Business Processes and Information Systems	9 CR
M-INFO-101235	Introduction to Data and Information Management	9 CR
M-INFO-101193	Foundations of Information Systems	9 CR
M-WIWI-104069	Information Security	9 CR
M-WIWI-101440	Information Services in Networks *First usage possible until 9/30/2021.*	8 CR
M-INFO-100786	IT-Security Management for Networked Systems	5 CR
M-INFO-100819	Cognitive Systems	6 CR
M-INFO-101178	Communication and Database Systems	8 CR
M-INFO-102557	Lego Mindstorms - Practical Course	4 CR
M-INFO-100757	Mechano-Informatics and Robotics	4 CR
M-INFO-100729	Human Computer Interaction	6 CR
M-INFO-101249	Mobile Computing and Internet of Things	5 CR
M-INFO-100818	Computer Architecture	6 CR
M-INFO-100893	Robotics I - Introduction to Robotics	6 CR
M-WIWI-101438	Semantic Knowledge Management	9 CR
M-INFO-100834	Security	6 CR
M-INFO-100833	Software Engineering II	6 CR
M-INFO-101836	Computer Engineering	6 CR
M-INFO-101194	Telematics	10 CR
M-INFO-101636	Web Applications and Service-Oriented Architectures (I)	4 CR

3.12 Advanced Studies in Economics and Management

Credits
18

Election block: Elective Modules in Business Administration (1 item)		
M-WIWI-101434	eBusiness and Service Management	9 CR
M-WIWI-101421	Supply Chain Management	9 CR
M-WIWI-101402	eFinance	9 CR
M-WIWI-101425	Strategy and Organization	9 CR
M-WIWI-101437	Industrial Production I	9 CR
M-WIWI-101464	Energy Economics	9 CR
M-WIWI-101435	Essentials of Finance	9 CR
M-WIWI-101465	Topics in Finance I	9 CR
M-WIWI-101467	Design, Construction and Sustainability Assessment of Buildings	9 CR
M-WIWI-101466	Real Estate Management	9 CR
M-WIWI-101424	Foundations of Marketing	9 CR
M-WIWI-101513	Human Resources and Organizations	9 CR
M-WIWI-102752	Fundamentals of Digital Service Systems	9 CR
M-WIWI-101423	Topics in Finance II	9 CR
M-WIWI-105610	Financial Data Science neu	9 CR
Election block: Elective Modules in Economics and Management (1 item)		
M-WIWI-101402	eFinance	9 CR
M-WIWI-101421	Supply Chain Management	9 CR
M-WIWI-101424	Foundations of Marketing	9 CR
M-WIWI-101425	Strategy and Organization	9 CR
M-WIWI-101434	eBusiness and Service Management	9 CR
M-WIWI-101435	Essentials of Finance	9 CR
M-WIWI-101437	Industrial Production I	9 CR
M-WIWI-101464	Energy Economics	9 CR
M-WIWI-101465	Topics in Finance I	9 CR
M-WIWI-101466	Real Estate Management	9 CR
M-WIWI-101467	Design, Construction and Sustainability Assessment of Buildings	9 CR
M-WIWI-101413	Applications of Operations Research	9 CR
M-WIWI-101499	Applied Microeconomics	9 CR
M-WIWI-101501	Economic Theory	9 CR
M-WIWI-101513	Human Resources and Organizations	9 CR
M-WIWI-101599	Statistics and Econometrics	9 CR
M-WIWI-101936	Methodical Foundations of OR	9 CR
M-WIWI-102752	Fundamentals of Digital Service Systems	9 CR
M-WIWI-103337	Optimization under Uncertainty	9 CR
M-WIWI-101403	Public Finance	9 CR
M-WIWI-101423	Topics in Finance II	9 CR
M-WIWI-101668	Economic Policy I	9 CR
M-WIWI-105610	Financial Data Science neu	9 CR

3.13 Advanced Studies in Law

Credits
6

Mandatory		
M-INFO-101253	Intellectual Property and Data Protection	6 CR

3.14 Research Course

Credits
6

Election block: Research Courses Choose (2 out of 3 Modules) (2 items)		
M-WIWI-101826	Seminar Module Economic Sciences	3 CR
M-INFO-101218	Seminar Module Law	3 CR
M-INFO-102058	Seminar Module Informatics	3 CR

4 Modules

M 4.1 Module: Advanced Object Orientation [M-INFO-100809]

Responsible: Prof. Dr.-Ing. Gregor Snelting
Organisation: KIT Department of Informatics
Part of: Advanced Studies in Informatics

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

Mandatory			
T-INFO-101346	Advanced Object Orientation	5 CR	Snelting

Content

- Behaviour and semantics of dynamic dispatch
- Implementation of single and multiple inheritance
- Genericity, refactoring
- Traits and mixins, virtual classes
- Cardelli's type system
- Analyses on the call graph, points-to analyses
- operational semantics, type safety
- bytecode JVM, bytecode verifier, dynamic compilation

Annotation
This is not a lecture on object-oriented software development! Rather, knowledge of object-oriented software engineering (e.g. Java, UML, Design Patterns) is required.

M   4.2 Module: Algorithmic Methods for Hard Optimization Problems [M-INFO-101237]

Responsible: Prof. Dr. Dorothea Wagner
Organisation: KIT Department of Informatics
Part of: Advanced Studies in Informatics

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

Mandatory		
T-INFO-103334	Algorithmic Methods for Hard Optimization Problems	5 CR	Wagner

Competence Goal
The goal of this course is to familiarize the students with hard problems and possible approaches to solve them. Online problems may also be part of the course.

Content
There are many practical problems that cannot be solved optimally - some not at all and some not in a resonable amount of time. An example is the "bin packing problem" where a collection of

objects must be packed using a possibly small number of bins. Moreover, problems sometimes arise where knowledge about the future (or even about the present) is incomplete, but a decision

is required neverthelss ("online problems"). Regarding bin packing, for example, there must be a point in time when you close the bins and send them away. Even if there are some more objects arriving later.

M   4.3 Module: Algorithms for Planar Graphs [M-INFO-101220]

Responsible: Prof. Dr. Dorothea Wagner
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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	Wagner

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

Responsible: Prof. Dr. Peter Sanders
Organisation: KIT Department of Informatics
Part of: Informatics

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

Mandatory			
T-INFO-100001	Algorithms I	6 CR	Sanders

M   4.5 Module: Algorithms II [M-INFO-101173]

Responsible: Prof. Dr. Hartmut Prautzsch
                   Prof. Dr. Peter Sanders
                   Prof. Dr. Dorothea Wagner

Organisation: KIT Department of Informatics

Part of: Advanced Studies 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-102020	Algorithms II	6 CR	Prautzsch, Sanders, Wagner

M   4.6 Module: Applications of Operations Research [M-WIWI-101413]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Election block: Compulsory Elective Courses (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
Election block: Supplementary Courses (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.

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.

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.

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.

Recommendation

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

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.

M 4.7 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

Credits	Grading scale	Recurrence	Duration	Language	Level	Version
8	Grade to a tenth	Each term	2 terms	German	1	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	Färber, Oberweis

Competence Certificate

The learning control for both courses takes the form of a written examination (60 minutes) in accordance with § 4(2), 1 SPO.

The module grade consists of the credit-weighted average of the grades for both courses.

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.

Prerequisites

None.

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

Recommendation

Knowledge of the module *Basic Notions of Computer Science* as well as *Algorithms I* is expected.

Workload

See german version.

M   4.8 Module: Applied Microeconomics [M-WIWI-101499]

Responsible:	Prof. Dr. Johannes Philipp Reiß
Organisation:	KIT Department of Economics and Management
Part of:	Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Election block: Compulsory Elective Courses (at least 9 credits)			
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-102792	Decision Theory	4,5 CR	Ehrhart
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.

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").

Prerequisites
None.

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.

Recommendation
None.

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

M   4.9 Module: Basic Notions of Computer Science [M-INFO-101170]

Responsible:	Dr. Sebastian Stüker
	Thomas Worsch
Organisation:	KIT Department of Informatics
Part of:	Informatics

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	Stüker, Worsch
T-INFO-101964	Basic Notions of Computer Science	6 CR	Stüker, Worsch

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 4.10 Module: Business Administration [M-WIWI-101492]

Responsible:	Prof. Dr. Marliese Uhrig-Homburg
	Prof. Dr. Christof Weinhardt
Organisation:	KIT Department of Economics and Management
Part of:	Business Administration

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

Mandatory			
T-WIWI-102818	Business Administration: Production Economics and Marketing	4 CR	Fichtner, Klarmann, Lützkendorf, Ruckes, Schultmann
T-WIWI-102816	Financial Accounting and Cost Accounting	4 CR	Strych

Competence Certificate

The assessments of the courses are written examinations (90 minutes each) according to §4(2), 1 of the examination regulation.

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 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.

Prerequisites

None

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.

Recommendation

It is highly recommended to fulfil this module only after completing the module *Foundations in Business Administration*.

Workload

See German version.

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: Advanced Studies in Informatics

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

Election block: Compulsory Elective Courses (between 1 and 2 items)			
T-WIWI-102697	Business Process Modelling	4,5 CR	Oberweis
T-WIWI-109799	Process Mining	4,5 CR	Oberweis
Election block: Supplementary Courses (between 0 and 1 items)			
T-WIWI-110711	Supplement Applied Informatics	4,5 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-104679	Foundations of Mobile Business	4,5 CR	Oberweis
T-WIWI-110541	Advanced Lab Informatics (Master)	4,5 CR	Professorenschaft des Fachbereichs Informatik

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.

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.

Prerequisites

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

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: Cognitive Systems [M-INFO-100819]**

Responsible: Prof. Dr. Gerhard Neumann
                    Prof. Dr. Alexander Waibel
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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-101356	Cognitive Systems	6 CR	Neumann, Waibel

M 4.13 Module: Commercial Law [M-INFO-101191]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: Law

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

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

M   4.14 Module: Communication and Database Systems [M-INFO-101178]

Responsible: Prof. Dr.-Ing. Klemens Böhm
                   Prof. Dr. Martina Zitterbart

Organisation: KIT Department of Informatics

Part of: Advanced Studies in Informatics

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

Mandatory		
T-INFO-101497	Database Systems	4 CR Böhm
T-INFO-102015	Introduction in Computer Networks	4 CR Zitterbart

Competence Goal

The students will

- have learned fundamentals of data communication as well as the design of communication systems,
- be familiar with the composition of the different protocols and their mechanisms and be able to design simple protocols on their own,
- have understood the relationships between the different communication layers,
- be able to explain the benefits of database technology at the end of the course,
- have understood the development of database applications and be able to set up and access simple databases,
- be familiar with the terminology and the underlying database theory.

Content

Distributed information systems are worldwide information repositories which are accessible by everybody at any place of the world at any time. The physical distance is bridged by telecommunication systems, while database management technology manages and coordinates data for arbitrary periods of time. In order to understand globally running processes, one has to understand both data transmission techniques and database technology. Besides the telecommunication and database technologies on their own, an understanding of their cooperation is required, too.

Workload

approx. 240 h

M   4.15 Module: Computer Architecture [M-INFO-100818]

Responsible: Prof. Dr.-Ing. Jörg Henkel
               Prof. Dr. Wolfgang Karl
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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	Henkel, Karl

M	**4.16 Module: Computer Engineering [M-INFO-101836]**

Responsible: Prof. Dr. Wolfgang Karl
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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 4.17 Module: Constitutional and Administrative Law [M-INFO-101192]

Responsible: Prof. Dr. Nikolaus Marsch
Organisation: KIT Department of Informatics
Part of: Law

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

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

Workload
See German version.

M   4.18 Module: Database Systems in Theory and Practice [M-INFO-101229]

Responsible:	Prof. Dr.-Ing. Klemens Böhm
Organisation:	KIT Department of Informatics
Part of:	Advanced Studies in Informatics

Credits	Grading scale	Duration	Level	Version
9	Grade to a tenth	2 terms	3	1

Mandatory			
T-INFO-103552	Lab: Working with Database Systems	4 CR	Böhm
Election block: Database Systems in Theory and Practice (at least 1 item as well as at least 5 credits)			
T-INFO-101317	Deployment of Database Systems	5 CR	Böhm
T-INFO-101305	Big Data Analytics	5 CR	Böhm

Workload
120 h

M 4.19 Module: Design, Construction and Sustainability Assessment of Buildings [M-WIWI-101467]

Responsible: Prof. Dr.-Ing. Thomas Lützkendorf
Organisation: KIT Department of Economics and Management
Part of: Advanced Studies in Economics and Management (Elective Modules in Business Administration)
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Mandatory			
T-WIWI-102742	Design, Construction and Sustainability Assessment of Buildings I	4,5 CR	Lützkendorf
T-WIWI-102743	Design, Construction and Sustainability Assessment of Buildings II	4,5 CR	Lützkendorf

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.

Competence Goal
The student

- knows the basics of sustainable design, construction and operation of buildings with an emphasis on building ecology
- has knowledge of building ecology assessment procedures and tools for design and assessment
- is capable of applying this knowledge to assessing the ecological advantageousness of buildings as well as their contribution to a sustainable development.

Prerequisites
None

Content
Sustainable design, construction and operation of buildings currently are predominant topics of the real estate sector, as well as "green buildings". Not only designers and civil engineers, but also other actors who are concerned with project development, financing and insurance of buildings or portfolio management are interested in these topics.

On the one hand the courses included in this module cover the basics of energy-efficient, resource-saving and health-supporting design and construction of buildings. On the other hand fundamental assessment procedures for analysing and communicating the ecological advantageousness of technical solutions are discussed. With the basics of green building certification systems the lectures provide presently strongly demanded knowledge.

Additionally, videos and simulation tools are used for providing a better understanding of the content of teaching.

Recommendation
The combination with the module *Real Estate Management* is recommended.

Furthermore a combination with courses in the area of

- Industrial production (energy flow in the economy, energy politics, emissions)
- Civil engineering and architecture (building physics, building construction)

is recommended.

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

M   4.20 Module: Digital Circuits Design [M-INFO-102978]

Responsible: Prof. Dr.-Ing. Uwe Hanebeck
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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	Karl

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: Advanced Studies in Economics and Management (Elective Modules in Business Administration)
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-111307	Digital Services: Foundations	4,5 CR	Satzger, Weinhardt
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-109816	Foundations of Interactive Systems	4,5 CR	Mädche
T-WIWI-109936	Platform Economy	4,5 CR	Dorner, 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.

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.

Prerequisites

None

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: Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Mandatory		
T-WIWI-103213	Basic Principles of Economic Policy	4,5 CR	Ott
Election block: Compulsory Elective Courses (1 item)		
T-WIWI-109121	Macroeconomic Theory	4,5 CR	Brumm
T-WIWI-102739	Public Revenues	4,5 CR	Wigger
T-WIWI-102908	Personnel Policies and Labor Market Institutions	4,5 CR	Nieken
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.

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

Prerequisites

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

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

Recommendation

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

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.

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

Responsible:	Prof. Dr. Clemens Puppe
Organisation:	KIT Department of Economics and Management
Part of:	Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-102609	Advanced Topics in Economic Theory	4,5 CR	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.

Competence Goal

See German version.

Prerequisites

None

Content

The lecture Introduction to Game Theory focuses on the basics of non-cooperative game theory. Model assumptions, solution concepts and applications are discussed in detail both for simultaneous games (normal form games) and for sequential games (extensive form games). Classical equilibrium concepts like the Nash equilibrium or the subgame perfect equilibrium, but also advanced concepts will be discussed in detail. If necessary, a brief insight into cooperative game theory will also be given.

The course Auction & Mechanism Design starts with the basic theory of equilibrium behavior and yield management in single object standard auctions. After introducing the yield equivalence theorem for standard auctions, the focus shifts to mechanism design and its applications for single-object auctions and bilateral exchanges.

The course Economics and Behavior introduces fundamental topics of behavioural economics in terms of content and methodology. Students will also gain insight into the design of economic experimental studies. Students will also be introduced to the reading of and critical examination of current research in behavioural economics.

Recommendation

None

Annotation

The course T-WIWI-102609 - Advanced Topics in Economic Theory is currently not available.

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

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

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.

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.

Prerequisites

None

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: Advanced Studies in Economics and Management (Elective Modules in Business Administration)
                     Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Mandatory		
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CR Weinhardt
Election block: Supplementary Courses (at least 4,5 credits)		
T-WIWI-102643	Derivatives	4,5 CR Uhrig-Homburg
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.

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.

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

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:	Advanced Studies in Economics and Management (Elective Modules in Business Administration)
	Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Mandatory			
T-WIWI-102746	Introduction to Energy Economics	5,5 CR	Fichtner
Election block: Supplementary Courses (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.

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.

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

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.)

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.

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 approximately 270 hours. For further information see German version.

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:	Advanced Studies in Economics and Management (Elective Modules in Business Administration)
	Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

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.

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.

Prerequisites

None

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:	Advanced Studies in Economics and Management (Elective Modules in Business Administration)
	Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

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

Competence Certificate

The module examination is an alternative exam assessment and consists of two parts in which a maximum of 100 points can be achieved:

In the first part of the examination, a maximum of 30 points can be achieved, which are distributed equally weighted over eight worksheets to be submitted during the semester. The worksheets of the first three weeks are representative for all following worksheets in terms of scope and degree of difficulty. With the beginning of the 4th week of the course, the handing in of the worksheets is considered to be part of the alternative exam assessment.

A maximum of 70 points can be achieved in the second part of the examination. For this part of the examination, the student write a "Final Exam" in the last week of the lecture period, which takes 2 hours.

Detailed information about the course schedule and the module exam will be announced at the first course date.

A retake opportunity for those who do not pass the module exam will take place at the end of the fourth September calendar week of the same year. The registration for the examination must be made at least 1 day before the beginning of the examination. The following applies to deregistration for the examination: Deregistration can be made online in the student portal up to 1 day before the start of the examination.

Competence Goal

The objective of the module is to provide fundamental financial knowledge for advanced applications in Financial Data Science and Financial Machine Learning. The course teaches concepts and provides weekly Python assignments to scientifically address the following topics: Robo Advisory, Linear Factor Models, Statistical Arbitrage, Monte Carlo Simulation, and Financial Machine Learning. The course is for the students, who are interested in financial markets, as well as for the students, who are interested in Data Science. Scientific financial market knowledge helps in creating financial innovations, such as a Robo Advisor. Practical knowledge in using Python helps in coding machines, which are essential for offering automated financial market solutions.

Content

The module covers the following topics:

- Robo Advisory: Investor preferences, Expected utility theory, Mean-variance optimal investing
- Linear Factor Models: prediction of returns, decomposition of risks, Capital Asset Pricing Model, Arbitrage Pricing Theory
- Statistical Arbitrage: ARMA-GARCH Modeling of Return Time Series
- Monte Carlo Simulation: Simulation of ARMA-GARCH processes
- Machine Learning: Least Squares Methods, Maximum Likelihood, Prediction of Returns, Prediction of Risks
- New developments in asset management: factor investing, smart beta, I-CAPM, Fama-MacBeth estimation of risk premia, factor anomalies

Annotation

Please note that the module is only offered every second summer semester (SS2021, SS2023).

Workload

The total workload for this module is approx. 270 hours (9 credit points). The total number of hours results from the effort for studying online videos, working on quiz questions, studying Ipython-Notebooks, participating in interactive "Python Sessions" and reading the recommended literature.

M 4.29 Module: Formal Systems [M-INFO-100799]

Responsible: Prof. Dr. Bernhard Beckert
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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   4.30 Module: Foundations in Business Administration [M-WIWI-101491]

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

Organisation: KIT Department of Economics and Management

Part of: Business Administration

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

Mandatory			
T-WIWI-102819	Business Administration: Finance and Accounting	4 CR	Ruckes, Uhrig-Homburg, Wouters
T-WIWI-102757	Introduction to Information Engineering and Management	4 CR	Geyer-Schulz, Weinhardt

Competence Certificate

The assessment is carried out as partial exams (according to §4(2), 1-3 of the examination regulation) of the single courses of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Competence Goal

The objectives of this module are that the student is capable of dealing with issues in finance, investments, accounting and information engineering and management.

Prerequisites

None

Content

The institutional framework and the modelling and formal description of a company's decisions play an essential role in this module. The basic idea and the foundations of static and dynamic investment rules are presented and applied to 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. The foundations of corporate finance are treated with a strong emphasis of the links to the capital market. Investment rules and corporate finance are instrumental for answering questions of source and application of funds, comparable to the lending and deposit business in banking. also an introduction to financial and management accoutning is provided. The organisation of company and the problems of management and control constitute an other important aspect of business administration and management science. Finally, the process of value creation and distribution as well as the principles of the taxation of a company are treated with an emphasis on the analysis of the profit and loss statement.

Two case studies, namely the foundation of an innovative information service company and the process chain of a B2B direct marketing company from the customer to the producer, focus on the interdisciplinary links between legal framework, advanced information technology, and the resulting design options for business processes.

Workload

See German version.

M   4.31 Module: Foundations of Information Systems [M-INFO-101193]

Responsible:	Prof. Dr.-Ing. Klemens Böhm
Organisation:	KIT Department of Informatics
Part of:	Advanced Studies in Informatics

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

Election block: Foundations of Information Systems (at least 1 item as well as at least 4 credits)			
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
T-INFO-103552	Lab: Working with Database Systems	4 CR	Böhm
T-INFO-105742	Big Data Analytics 2	3 CR	Böhm
T-INFO-101305	Big Data Analytics	5 CR	Böhm
T-INFO-101317	Deployment of Database Systems	5 CR	Böhm
Election block: Foundations of Information Systems - Mandatory Courses (at least 1 item as well as at least 5 credits)			
T-INFO-101305	Big Data Analytics	5 CR	Böhm
T-INFO-101317	Deployment of Database Systems	5 CR	Böhm

Competence Goal

The students

- see the necessity of specialised systems for information management and are able to define and deploy decision criteria for purchasing such software,
- are aware of the fundamental approaches in information 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.

Prerequisites

None

Content

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

Recommendation

It is recommended to take this module after completition of the module *Communication and Database Systems* [IW3INKD].

Annotation

The courses in this module are offered irregularly, however, the exam can be taken anytime.

Workload

approx. 300 h
For further details see the German version.

M 4.32 Module: Foundations of Marketing [M-WIWI-101424]

Responsible: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Economics and Management
Part of: Advanced Studies in Economics and Management (Elective Modules in Business Administration)
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Mandatory			
T-WIWI-102805	Managing the Marketing Mix	4,5 CR	Klarmann
Election block: Supplementary Courses (at least 4,5 credits)			
T-WIWI-111367	B2B Sales Management	4,5 CR	Klarmann

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.

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
- 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

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

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").

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 4.33 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: Advanced Studies in Economics and Management (Elective Modules in Business Administration)
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

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

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.

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

Prerequisites
None

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.

Recommendation
None

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

M	**4.34 Module: Human Computer Interaction [M-INFO-100729]**

Responsible: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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-101266	Human-Machine-Interaction	6 CR	Beigl
T-INFO-106257	Human-Machine-Interaction Pass	0 CR	Beigl

M 4.35 Module: Human Resources and Organizations [M-WIWI-101513]

Responsible:	Prof. Dr. Petra Nieken
Organisation:	KIT Department of Economics and Management
Part of:	Advanced Studies in Economics and Management (Elective Modules in Business Administration)
	Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Mandatory			
T-WIWI-102909	Human Resource Management	4,5 CR	Nieken
Election block: Supplementary Courses (between 4,5 and 5,5 credits)			
T-WIWI-102630	Managing Organizations	3,5 CR	Lindstädt
T-WIWI-102908	Personnel Policies and Labor Market Institutions	4,5 CR	Nieken
T-WIWI-102871	Problem Solving, Communication and Leadership	2 CR	Lindstädt

Competence Certificate

The assessment is carried out as partial written exams 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

- knows and analyzes basic concepts, instruments, and challenges of present human resource and organizational management.
- uses the techniques he / she has learned to evaluate strategic situations which occur in human resource and organizational management.
- evaluates the strengths and weaknesses of existing structures and rules based on systematic criterions.
- Discusses and evaluates the practical use of models and methods by using case studies.
- has basic knowledge of fit and challenges of different scientific methods in the context of personnel and organizational economics.

Prerequisites

The course "Human Resource Management" is compulsory and must be examined.

Content

Students acquire basic knowledge in the field of human resource and organizational management. Strategic as well as operative aspects of human resource management practices are analyzed. The module offers an up-to-date overview over basic concepts and models. It also shows the strengths and weaknesses of rational concepts in human resources and organizational management.

The students learn to apply methods and instruments to plan, select, and manage staff. Current issues of organizational management or selected aspects of personnel politics are examined and evaluated.

The focus lies on the strategic analysis of decisions and the use microeconomic or behavioral approaches. Empirical results of field or lab studies are discussed critically.

Recommendation

Completion of module Business Administration is recommended.

Basic knowledge of microeconomics, game theory and statistics is recommended.

Workload

The total workload for this module is approximately 270 hours.

M   4.36 Module: Industrial Production I [M-WIWI-101437]

Responsible:	Prof. Dr. Frank Schultmann
Organisation:	KIT Department of Economics and Management
Part of:	Advanced Studies in Economics and Management (Elective Modules in Business Administration)
	Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Mandatory			
T-WIWI-102606	Fundamentals of Production Management	5,5 CR	Schultmann
Election block: Supplementary Courses (3,5 credits)			
T-WIWI-102870	Logistics and Supply Chain Management	3,5 CR	Schultmann, Wiens
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.

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.

Prerequisites

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

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: Information Security [M-WIWI-104069]

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: Advanced Studies in Informatics

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

Mandatory			
T-WIWI-110342	Applied Informatics – Information Security	4,5 CR	Volkamer
Election block: Compulsory Elective Courses (1 item)			
T-WIWI-108439	Advanced Lab Security, Usability and Society	4,5 CR	Volkamer
T-WIWI-109786	Advanced Lab Security	4,5 CR	Volkamer

Competence Certificate

The module examination is carried out in the form of partial examinations on the selected courses of the module, with which the minimum requirement at creditpoints is fulfilled. The learning control is described in each course. The overall score of the module is made up of the sub-scores weighted with creditpoints and is cut off after the first comma point.

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.

Prerequisites

None

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.

Annotation

This new module can be chosen from summer term 2018.

Workload

The total workload for this module is approximately 270 hours.

M	4.38 Module: Information Services in Networks [M-WIWI-101440]

Responsible: N.N.
Prof. Dr. Hartmut Schmeck

Organisation: KIT Department of Economics and Management

Part of: Advanced Studies in Informatics (Usage until 9/30/2021)

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

Election block: Compulsory Elective Courses ()			
T-INFO-101276	Data and Storage Management	4 CR	Neumair
T-INFO-101284	Integrated Network and Systems Management	4 CR	Neumair
T-WIWI-110541	Advanced Lab Informatics (Master)	4,5 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-110848	Semantic Web Technologies	4,5 CR	Käfer

Competence Certificate

Please note that the module will no longer be offered as of winter semester 2021/22.

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

None

Workload

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

M 4.39 Module: Intellectual Property and Data Protection [M-INFO-101253]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: Advanced Studies in Law

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

Mandatory			
T-INFO-109840	Intellectual Property and Data Protection	6 CR	Dreier, Eichenhofer

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 4.40 Module: Internship [M-WIWI-101433]

Responsible:	Studiendekan der KIT-Fakultät für Informatik
	Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften
Organisation:	KIT Department of Economics and Management
Part of:	Internship

Credits	Grading scale	Recurrence	Duration	Level	Version
8	Grade to a tenth	Once	1 term	1	1

Mandatory			
T-WIWI-103093	Internship	8 CR	Studiendekan der KIT-Fakultät für Informatik, Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften

Competence Certificate

The assessment is in the form of a certificate of employment about at least 6 weeks, a written report (typewritten, not handwritten) and a short presentation. The internship is not graded.

Competence Goal

This module serves to impart interdisciplinary key qualifications:

The student

- carries out professional tasks in the context of Information Engineering and Management to learn about the requirements on the engineer,
- describes in a short report the executed activities precisely and coherent, and judges about them critically,
- presents effectively is experiences gained during the internship using appropriate media support and gets involved professionally in the subsequent discussion, and
- trains via concrete and constructive criticism his/her competence for problem solving.

The presentation primarily serves for the communication between student, company, and examiner with the goal of initiating further cooperation in the context of the Bachelor thesis and/or a project

Prerequisites

None

Content

It is the responsibility of the students to apply for an internship in a suitable company or public organization at which the internship can be fulfilled.

The process for the internship has the following (sequential) steps:

1. **Choice of the examiner and of the company or organization by the student.**
   During the internship each student is attended by an examiner of the degree programme and by an advisor of the company. In case a student does not succeed in finding an examiner for the internship, he can request the assignment of an examiner from the examination board of the Bachelor programme in Information Engineering and Management. When enrolling for the internship, the student fills the form for the internship and he hands the form over to the examiner and the students' secretary. If required, the students' secretary certifies the compulsory character of the internship as part of the Bachelor programme in Information Engineering and Management.
2. **Internship**
   The student passes the internship in the chosen company or organization.
3. **Preparation of a short report and presentation:**
   At the end of the internship, the employment is proven by a certificate of employment. The examiner receives a report (maximal 2 A4 pages) and the student gives feedback on the internship with a short presentation (approx. 15 minutes) followed by a short discussion (approx. 5 minutes).
4. **Presentation and proof of performance.**
   The short presentation may by given in the form of a talk with the examiner, in a colloquium or in a seminar. The form is fixed at the registration of the internship with the examiner. The certificate of employment of the company and the short report must be delivered at the examiner *before* the presentation. Based on these, a certificate of performance if produced and transferred to the office of study ("Studienbüro").

Recommendation

It is recommended that the internship is taken between the 4th and the 5th term of the Bachelor programme Information Engineering and Management.

Annotation

The internship is regulated in §14a of the examination regulation.

Examiners are all lecturers of the degree programme.

The choice of the examiner has to be **prior** to the start of the internship (cf. content description).

The form for the internship is available at the examination offices of the two faculties participating in the programme.

Workload

See German version.

M 4.41 Module: Introduction to Civil Law [M-INFO-101190]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: Law

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   4.42 Module: Introduction to Data and Information Management [M-INFO-101235]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: Advanced Studies in Informatics

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

Mandatory			
T-INFO-101497	Database Systems	4 CR	Böhm
Election block: Introduction to Data and Information Management (at least 1 item as well as at least 5 credits)			
T-INFO-101305	Big Data Analytics	5 CR	Böhm
T-INFO-103552	Lab: Working with Database Systems	4 CR	Böhm
T-INFO-101317	Deployment of Database Systems	5 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

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

Prerequisites
None

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	**4.43 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: Operations Research

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

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) according to Section 4(2), 1 of the examination regulation.

In each term (usually in March and July), one examination is held for both courses.

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.

Module grade calculation

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

Prerequisites

None

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.

Workload

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

M 4.44 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:	Statistics

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.

Competence Goal

See German version.

Module grade calculation

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

Prerequisites

Keine

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

Workload

The total workload for this module is approximately 300 hours. For further information see German version.

M   4.45 Module: IT-Security Management for Networked Systems [M-INFO-100786]

Responsible: Prof. Dr. Hannes Hartenstein
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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-101323	IT-Security Management for Networked Systems	5 CR	Hartenstein

M 4.46 Module: Lego Mindstorms - Practical Course [M-INFO-102557]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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 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 Java 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 Java 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.

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

M 4.47 Module: Mathematics I [M-MATH-101311]

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

Credits	Grading scale	Recurrence	Duration	Level	Version
8	Grade to a tenth	Once	1 term	1	1

Mandatory			
T-MATH-102266	Mathematics I for Information Engineering and Management - Exam	7 CR	Rieder, Weiß, Wieners
T-MATH-102267	Mathematics I for Information Engineering and Management - Exercise	1 CR	Rieder, Weiß, Wieners

Competence Certificate

The assessment in this module consists of

1. a graded certificate of exercise following §4(2), 3 of the examination regulation from the exercises to mathematics I (1 credit) and
2. a written examination of 60 minutes on the lectures mathematics I following §4(2), 1 of the examination regulations (7 credits).

The grade of the module is computed as a weighted sum, where the grade of the written examiniation has a weight of 80% and the certificate a weight of 20%.

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.

Prerequisites

None

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.

Annotation

None.

Workload

See German version.

M 4.48 Module: Mathematics II [M-MATH-101312]

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

Credits	Grading scale	Recurrence	Duration	Level	Version
8	Grade to a tenth	Once	1 term	1	1

Mandatory			
T-MATH-102269	Mathematics II for Information Engineering and Management - Exam	7 CR	Rieder, Weiß, Wieners
T-MATH-102268	Mathematics II for Information Engineering and Management - Exercise	1 CR	Rieder, Weiß, Wieners

Competence Certificate

The assessment in this module consists of

1. a graded certificate of exercise following §4(2), 3 of the examination regulation from the exercises to mathematics II (1 credit) and
2. a written examination of 60 minutes on the lectures mathematics II following §4(2), 1 of the examination regulations (7 credits).

The grade of the module is computed as a weighted sum, where the grade of the written examiniation has a weight of 80% and the certificate a weight of 20%.

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.

Workload

See German version.

M 4.49 Module: Mechano-Informatics and Robotics [M-INFO-100757]

Responsible:	Prof. Dr.-Ing. Tamim Asfour
Organisation:	KIT Department of Informatics
Part of:	Advanced Studies 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 Goal
Students understand the basics of the synergistic integration of mechatronics, computer science and artificial intelligence methods on 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 topic 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 of robot motions and actions. This includes an introduction to artificial neural networks, the description of dynamical systems in state space, the learning of movement primitives as well as methods for haptic perception for object exploration. The topics and content is illustrated using practical examples from humanoid robotics.

Recommendation
Basispraktikum Mobile Roboter.

M 4.50 Module: Methodical Foundations of OR [M-WIWI-101936]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Election block: Compulsory Elective Courses (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
Election block: Supplementary Courses (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.

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.

Prerequisites
At least one of the courses "Nonlinear Optimization I" and "Global Optimization I" has to be examined.

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

Responsible: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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-102061	Mobile Computing and Internet of Things	5 CR	Beigl

Prerequisites
None

M 4.52 Module: Mobile Robots – Practical Course [M-INFO-101184]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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 Goal

The student is able to understand circuit diagrams and can assemble, test and debug complex PCBs. The student is 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 ASURO robot in groups of two. Each student will be provided with his own robot, which he has 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 4.53 Module: Module Bachelor Thesis [M-WIWI-101611]

Responsible:	Studiendekan der KIT-Fakultät für Informatik
	Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften
Organisation:	KIT Department of Economics and Management
Part of:	Bachelor Thesis

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

Mandatory			
T-WIWI-103095	Bachelor Thesis	12 CR	Abeck, Lindstädt

Competence Certificate

The Bachelor thesis is examined by an examiner following the examination regulation. The examiner has to be involved in the degree programme. Involved in the degree programme are the persons that coordinate a module or a lecture of the degree programme.

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.

Prerequisites

The regulations for the Bachelor thesis can be found in §14 of the examination regulation.

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 6 months. The Bachelor thesis may also be written in English.

Workload

The total workload for this module is approximately 360 hours. For further information see German version.

M 4.54 Module: Optimization under Uncertainty [M-WIWI-103337]

Responsible:	Prof. Dr. Steffen Rebennack
Organisation:	KIT Department of Economics and Management
Part of:	Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Mandatory		
T-WIWI-106546	Introduction to Stochastic Optimization	4,5 CR	Rebennack
Election block: Supplementary Courses (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.

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.

Prerequisites

The course *Introduction to Stochastic Optimization* has to be taken.

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.

Recommendation

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

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 for this module is approximately 270 hours (9 credits). The allocation is made according to the credit points of the courses of the module. The total number of hours per course is determined by the amount of time spent attending the lectures and exercises, as well as the exam times and the time required to achieve the module's learning objectives for an average student for an average performance.

M 4.55 Module: Orientation Exam [M-WIWI-101528]

Organisation: University
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-101964	Basic Notions of Computer Science	6 CR	Stüker, Worsch
T-INFO-101531	Programming	5 CR	Koziolek, Reussner
T-WIWI-102708	Economics I: Microeconomics	5 CR	Puppe, Reiß
T-INFO-101965	Basic Notions of Computer Science Pass	0 CR	Stüker, Worsch
T-INFO-101967	Programming Pass	0 CR	Koziolek, Reussner

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

Prerequisites
None

M 4.56 Module: Programming [M-INFO-101174]

Responsible: Prof. Dr.-Ing. Anne Koziolek
Prof. Dr. Ralf Reussner
Prof. Dr.-Ing. Gregor Snelting

Organisation: KIT Department of Informatics

Part of: Informatics

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

Responsible:	Prof. Dr. Berthold Wigger
Organisation:	KIT Department of Economics and Management
Part of:	Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Election block: Compulsory Elective Courses (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
T-WIWI-109590 Public Sector Finance	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

See German version.

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.

Recommendation

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

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

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

M 4.58 Module: Real Estate Management [M-WIWI-101466]

Responsible: Prof. Dr.-Ing. Thomas Lützkendorf
Organisation: KIT Department of Economics and Management
Part of: Advanced Studies in Economics and Management (Elective Modules in Business Administration)
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Mandatory			
T-WIWI-102744	Real Estate Management I	4,5 CR	Lützkendorf
T-WIWI-102745	Real Estate Management II	4,5 CR	Lützkendorf

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.

Competence Goal

The student

- possesses an overview concerning the different facets and interrelationships within the real estate business, the important decision points in real estate lifecycle and the different views and interests of the actors concerned, and
- is capable of applying basic economic methods an procedures to problems within the real estate area.

Prerequisites

None

Content

The real estate business offers graduates very interesting jobs and excellent work- and advancement possibilities. This module provides an insight into the macroeconomic importance of this industry, discusses problems concerned to the administration of real estate and housing companies and provides basic knowledge for making decisions both along the lifecycle of a single building and the management of real estate portfolios. Innovative operating and financing models are illustrated, as well as the current development when looking at real estate as an asset-class.

This module is also suitable for students who want to discuss macroeconomic, business-management or financial problems in a real estate context.

Recommendation

The combination with the module *Design Constructions and Assessment of Green Buildings* is recommended.

Furthermore a combination with courses in the area of

- Finance
- Insurance
- Civil engineering and architecture (building physics, building construction, facility management)

is recommended.

Workload

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

M 4.59 Module: Robotics I - Introduction to Robotics [M-INFO-100893]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: Advanced Studies in Informatics

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

Mandatory			
T-INFO-108014	Robotics I - Introduction to Robotics	6 CR	Asfour

M 4.60 Module: Security [M-INFO-100834]

Responsible: Prof. Dr. Jörn Müller-Quade
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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-101371	Security	6 CR	Hofheinz, Müller-Quade

M   4.61 Module: Semantic Knowledge Management [M-WIWI-101438]

Responsible: Prof. Dr. York Sure-Vetter
Organisation: KIT Department of Economics and Management
Part of: Advanced Studies 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
Election block: Supplementary Courses (at least 1 item)			
T-WIWI-110340	Applied Informatics – Applications of Artificial Intelligence	4,5 CR	Färber
T-WIWI-102697	Business Process Modelling	4,5 CR	Oberweis
T-WIWI-110541	Advanced Lab Informatics (Master)	4,5 CR	Professorenschaft des Fachbereichs Informatik

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.

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

Prerequisites

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

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

Responsible:	Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften
Organisation:	KIT Department of Economics and Management
Part of:	Research Course

Credits	Grading scale	Language	Level	Version
3	Grade to a tenth	German	3	1

Election block: Compulsory Elective Courses (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.

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.

Prerequisites

None.

Content

The module consists of a seminar, that is related to the research field of economic sciences. A complete list of available seminars is published in the internet.

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

Responsible: Professorenschaft des Fachbereichs Informatik
Organisation: KIT Department of Informatics
                   KIT Department of Economics and Management
Part of: Research Course

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

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

M 4.64 Module: Seminar Module Law [M-INFO-101218]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: Research Course

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	Dreier

M   4.65 Module: Software Engineering I [M-INFO-101175]

Responsible: Prof. Dr.-Ing. Anne Koziolek
                    Prof. Dr. Ralf Reussner
                    Prof. Dr. Walter Tichy
Organisation: KIT Department of Informatics
Part of: Informatics

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	Koziolek, Reussner, Tichy
T-INFO-101995	Software Engineering I Pass	0 CR	Tichy

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	**4.66 Module: Software Engineering II [M-INFO-100833]**

Responsible: Prof. Dr.-Ing. Anne Koziolek
                Prof. Dr. Ralf Reussner
                Prof. Dr. Walter Tichy

Organisation: KIT Department of Informatics

Part of: Advanced Studies 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-101370	Software Engineering II	6 CR	Koziolek, Reussner, Tichy

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

M 4.67 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:	Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Election block: Supplementary Courses (between 1 and 2 items)			
T-WIWI-103063	Analysis of Multivariate Data	4,5 CR	Grothe
T-WIWI-103066	Data Mining and Applications	4,5 CR	Nakhaeizadeh
T-WIWI-103064	Financial Econometrics	4,5 CR	Schienle
T-WIWI-110939	Financial Econometrics II	4,5 CR	Schienle
T-WIWI-103065	Statistical Modeling of Generalized Regression Models	4,5 CR	Heller
Mandatory			
T-WIWI-102736	Economics III: Introduction in Econometrics	5 CR	Schienle

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

- 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.

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.

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

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: Advanced Studies in Economics and Management (Elective Modules in Business Administration)
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Election block: Strategy and Organization (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-102629	Management and Strategy	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 describes both central concepts of strategic management as well as concepts and models for the design of organizational structures.
- He / she evaluates the strengths and weaknesses of existing organizational structures and regulations on the basis of systematic criteria.
- The management of organizational changes discusses and examines the students by means of case studies to what extent the models can be used in practice and what conditions must apply to them.
- In addition, students plan to use IT to support corporate governance.

Content

The module has a practical and action-oriented structure and provides the student with an up-to-date overview of basic skills concepts and models of strategic management and a realistic picture of possibilities and limitations rational design approaches of the organization.
The focus is firstly on internal and external strategic analysis, concept and sources of competitive advantage, Formulation of competitive and corporate strategies as well as strategy assessment and implementation. Secondly strengths and weaknesses of organizational structures and regulations are assessed on the basis of systematic criteria. Concepts for the organization of organizational structures, the regulation of organizational processes and the control organizational changes are presented.

Workload

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

M   4.69 Module: Supply Chain Management [M-WIWI-101421]

Responsible:	Prof. Dr. Stefan Nickel
Organisation:	KIT Department of Economics and Management
Part of:	Advanced Studies in Economics and Management (Elective Modules in Business Administration)
	Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Mandatory			
T-WIWI-109936	Platform Economy	4,5 CR	Dorner, Weinhardt
Election block: Supplementary Courses (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.

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

Prerequisites

The course T-WIWI-107506 "Platform Economy" has to be taken.

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 4.70 Module: Telematics [M-INFO-101194]

Responsible:	Prof. Dr. Martina Zitterbart
Organisation:	KIT Department of Informatics
Part of:	Advanced Studies in Informatics

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

Mandatory			
T-INFO-102015	Introduction in Computer Networks	4 CR	Zitterbart
T-INFO-101338	Telematics	6 CR	Zitterbart

Competence Goal

The students will broaden their knowledge of computer networks initially learnt in the module Telematics [IW3INTM].
They learn about problems and solutions in the domains of wireless, multimedia, or secure communications and they will be able to analyse and evaluate specific solutions in those domains.

Prerequisites

None

Content

Selected protocols, architectures, mechanisms, and algorithms in the chosen domains will be analysed in detail. The student hereby may choose among mobile and wireless communications, principles of the design of secure communication protocols, and protocols and techniques for multimedia communication.

Recommendation

The lecture *Telematics* [24128] builds on the content of the lecture *Introduction in Computer Networks* [24519] and should therefore only be taken after successful completion of the lecture *Introduction in Computer Networks* [24519].

Workload

approx. 300 h
For further details see the German version.

M 4.71 Module: Theoretical Informatics [M-INFO-101189]

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

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	Müller-Quade, Sanders, Wagner

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 | **4.72 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: Advanced Studies in Economics and Management (Elective Modules in Business Administration)
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Election block: Compulsory Elective Courses (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-107505	Financial Accounting for Global Firms	4,5 CR	Luedecke
T-WIWI-102623	Financial Intermediation	4,5 CR	Ruckes
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
T-WIWI-110511	Strategic Finance and Technoloy Change	1,5 CR	Ruckes

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.

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

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*.

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.

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

M 4.73 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: Advanced Studies in Economics and Management (Elective Modules in Business Administration)
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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

Election block: Compulsory Elective Courses (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-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
T-WIWI-110511	Strategic Finance and Technoloy Change	1,5 CR	Ruckes

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.

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

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*.

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

Responsible: Prof. Dr. Sebastian Abeck
Organisation: KIT Department of Informatics
Part of: Advanced Studies 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 (Master) [T-WIWI-110541]

Responsible: Professorenschaft des Fachbereichs Informatik
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101438 - Semantic Knowledge Management
M-WIWI-101440 - Information Services in Networks
M-WIWI-101476 - Business Processes and Information Systems

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

Events					
WT 20/21	2512402	Practical Course Blockchain Hackathon (Bachelor)		Practical course / ⚙	Sunyaev, Kannengießer
WT 20/21	2512501	Practical Course Cognitive Automobiles and Robots (Master)	3 SWS	Practical course / ▯	Zöllner
WT 20/21	2512600	Project lab Information Service Engineering (Master)	2 SWS	Practical course / ⚙	Sack
WT 20/21	2513312	Seminar Linked Data and the Semantic Web (Bachelor)	2 SWS	Seminar / ▯	Färber, Käfer, Heling, Bartscherer
WT 20/21	2513313	Seminar Linked Data and the Semantic Web (Master)	2 SWS	Seminar / ▯	Färber, Käfer, Heling, Bartscherer
ST 2021	2512204	Lab Realisation of innovative services (Bachelor)	3 SWS	Practical course / ⚙	Oberweis, Schiefer, Schüler, Toussaint
ST 2021	2512400	Advanced Lab Development of Sociotechnical Information Systems (Bachelor)	3 SWS	Practical course / ▯	Sunyaev, Pandl
ST 2021	2512402	Advanced Lab Blockchain Hackathon (Bachelor)		Practical course / ▯	Sunyaev, Beyene, Kannengießer
ST 2021	2612554	Practical lab Security, Usability and Society (Bachelor)	3 SWS	Practical course / ▯	Strufe, Mayer, Arias Cabarcos, Berens, Mossano, Beckmann
Exams					
WT 20/21	7900047	Advanced Lab Implementation of Innovative Services (Bachelor)			Oberweis
WT 20/21	7900115	Advanced Lab Development of Sociotechnical Information Systems (Bachelor)			Sunyaev
WT 20/21	7900116	Advanced Lab Security, Usability and Society (Bachelor)			Volkamer
ST 2021	7900016	Advanced Lab Development of Sociotechnical Information Systems (Bachelor)			Sunyaev
ST 2021	7900029	Practical lab Security, Usability and Society (Bachelor)			Volkamer
ST 2021	7900085	Advanced Lab Realization of innovative services (Bachelor)			Oberweis
ST 2021	7900096	Advanced Lab Blockchain Hackathon (Bachelor)			Sunyaev

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.

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

V	**Practical Course Cognitive Automobiles and Robots (Master)** 2512501, WS 20/21, 3 SWS, Language: German/English, Open in study portal	**Practical course (P)** **Online**

Content
The lab is intended as a practical supplement to lectures such as "Machine Learning". The theoretical basics are applied in the lab course. The aim of the lab course is that the participants work together to design, develop and evaluate a subsystem from the field of robotics and cognitive systems using one or more procedures from the field of AI/ML.

In addition to the scientific objectives involved in the investigation and application of the methods, aspects of project-specific teamwork in research (from specification to presentation of the results) are also developed in this practical course.

The individual projects require the analysis of the task at hand, selection of suitable procedures, specification and implementation and evaluation of the approach taken. Finally, the chosen solution has to be documented and presented in a short presentation.

Learning objectives:

- Students can practically apply knowledge from the Machine Learning lecture in a selected field of current research in robotics or cognitive automobiles.
- Students master the analysis and solution of corresponding problems in a team.
- Students can evaluate, document and present their concepts and results.

Recommendations:

Attendance of the lecture machine learning, C/C++ knowledge, Python knowledge

Workload:

The workload of 4.5 credit points consists of the time spent in the lab for practical implementation of the selected solution, as well as 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.

V	**Project lab Information Service Engineering (Master)** 2512600, WS 20/21, 2 SWS, Language: English, Open in study portal	**Practical course (P)** **Blended (On-Site/Online)**

Content

The **ISE project course** is based on the summer semester lecture **"Information Service Engineering"**. The topics of the ISE project course focus on artificial intelligence based applications. In particular, we are covering the following:

- Natural Language Processing
- Knowledge Graphs
- Deep Learning

Goal of the course is to work on a research problem in small groups (3-4 students) related to the ISE lecture topics, i.e. Natural Language Processing, Knowledge Graphs, and Machine Learning. The solution of the given research problem requires the development of a software implementation.

The project will be worked on in teams of 3-4 students each, guided by a tutor from the teaching staff.

Required coursework includes:

- Mid term presentation (5-10 min)
- Final presentation (10-15 min)
- Course report (c. 20 pages)
- Participation and contribution of the students during the course
- Software development and delivery

Notes:

The ISEproject course can also be credited as a **seminar**.

The project will be worked on in teams of 3-4 students each, guided by a tutor from the teaching staff.

The project course will be restricted to 15 participants.

Participation in the lecture "Information Service Engineering" (summer semester) is required.

ISE Tutor Team:

- Dr. Mehwish Alam
- Dr. Danilo Dessi
- M. Sc. Genet Asefa Gesese
- M. Sc. Fabian Hoppe
- M. Sc. Zahra Rezaie
- M. Sc. Sasha Vsesviatska
- B. Sc. Tabea Tietz

Organizational issues

Projektpraktikum Information Service Engineering can also be credited as a **seminar**.

V	**Seminar Linked Data and the Semantic Web (Bachelor)** 2513312, WS 20/21, 2 SWS, Language: German/English, Open in study portal	**Seminar (S)** **Online**

Content

Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this 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 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 Linked Data and the Semantic Web (Master)** 2513313, WS 20/21, 2 SWS, Language: German/English, Open in study portal	**Seminar (S)** **Online**

Content

Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this 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 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	**Lab Realisation of innovative services (Bachelor)** 2512204, SS 2021, 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).

Further information can be found on the ILIAS page of the lab.

Organizational issues

Die genauen Termine und Informationen zur Anmeldung werden auf der Veranstaltungsseite bekannt gegeben.

V **Advanced Lab Development of Sociotechnical Information Systems (Bachelor)** 2512400, SS 2021, 3 SWS, Language: German/English, Open in study portal	**Practical course (P)** **Online**

Content

The aim of the lab is to get to know the development of socio-technical information systems in different application areas. In the event framework, you should develop a suitable solution strategy for your problem alone or in group work, collect requirements, and implement a software artifact based on it (for example, web platform, mobile apps, desktop application). Another focus of the lab is on the subsequent quality assurance and documentation of the implemented software artifact.

Registration information will be announced on the course page.

V **Practical lab Security, Usability and Society (Bachelor)** 2612554, SS 2021, 3 SWS, Language: German/English, Open in study portal	**Practical course (P)** **Online**

Content

The internship "Security, Usability and Society" will cover topics both of usable security and privacy programming, and how to conduct user studies. This internship will be only in English. The kick-off, the presentations, and every written material to be graded must be in English. Communications with supervisors can be in German.
WiWi portal: https://portal.wiwi.kit.edu/ys/4628

Important dates:

Kick-off: 06.04.2021, 10:00-11:00 CET in Microsoft Teams - Link

Report + code submission : 07.09.2021, 23:59 CET

Presentation deadline : 20.09.2021, 23:59 CET

Presentation day: 24.09.2021, 09:00 CET

Topics:

Privacy Friendly apps

In this subject, 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.

- Notes 2.0

Programming Usable Security Intervention

In this subject, students develop a part of coding, an extension, or another programming task dealing with various usable security interventions, eg as an extension. Eg TORPEDO (https://secuso.aifb.kit.edu/english/TORPEDO.php) or PassSec + (https://secuso.aifb.kit.edu/english/PassSecPlus.php). Just as before, 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.

- Password Manager Enrolment Add-On
- Portfolio Graphical Recognition-Based Passwords with Gamepads
- Visualization app to explore Facebook behavioral data collection

Designing Security User studies (online studies only)

These topics are related to how to set up and conducting user studies of various types. This year, due to the Corona outbreak, we decided to conduct online studies only; otherwise, interviews and in lab studies would have been possible. At the end of the semester, the students present a report / paper and a talk in which they present their results.

- Neurotechnologies, Neuroprivacy, and User Acceptance
- Expert feedback for an anti-phishing webpage template (English only)
- "Your website has been hacked" - How to inform business owners about security issues on their webpages in more sensitive ways

Please, note that registration is not required to participate in the kick-off meeting.

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) .

T 5.2 Course: Advanced Lab Security [T-WIWI-109786]

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

Type Examination of another type	**Credits** 4,5	**Grading scale** Grade to a third	**Recurrence** Each winter term	**Version** 2

Events					
WT 20/21	2512557	Practical Course Security (Master)	4 SWS	Practical course / 🖥	Baumgart, Volkamer, Mayer
Exams					
WT 20/21	7900046	Advanced Lab Security (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.

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

V Practical Course Security (Master)
2512557, WS 20/21, 4 SWS, Language: German, Open in study portal

Practical course (P)
Online

Content
The lab deals with the IT security of everyday utensils. Implemented security mechanisms are first theoretically investigated and put to the test with practical attacks. Finally, countermeasures and suggestions for improvement are worked out. The lab is offered within the competence center for applied security technologies (KASTEL) and is supervised by several institutes.

The success control takes the form of a final presentation, a thesis and the handing over of the developed code.

More information on https://ilias.studium.kit.edu/goto_produktiv_crs_998421.html

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	Each summer term	2

Events					
WT 20/21	2512554	Practical Course Security, Usability and Society (Bachelor)	3 SWS	Practical course / 🖥	Volkamer, Strufe, Mayer, Arias Cabarcos, Aldag, Berens, Düzgün, Mossano, Beckmann
WT 20/21	2512555	Practical Course Security, Usability and Society (Master)	3 SWS	Practical course / 🖥	Volkamer, Strufe, Mayer, Arias Cabarcos, Aldag, Berens, Düzgün, Mossano, Beckmann
ST 2021	2612554	Practical lab Security, Usability and Society (Bachelor)	3 SWS	Practical course / 🖥	Strufe, Mayer, Arias Cabarcos, Berens, Mossano, Beckmann
Exams					
WT 20/21	7900116	Advanced Lab Security, Usability and Society (Bachelor)			Volkamer
WT 20/21	7900138	Advanced Lab Security, Usability and Society (Master)			Volkamer
ST 2021	7900029	Practical 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 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 is expected to be offered from winter term 2018/2019.

Contents:

In the course of the programming lab, changing topics from the field of Human Factors in Security und Privacy will be worked on.

Learning goals:

The student

- can apply the basics of information security
- is able to implement appropriate measures to achieve different protection goals
- can structure a software project in the field of information security
- can use the Human Centred Security and Privacy by Design technique to develop user-friendly software
- can explain and present technical facts and the results of the programming lab in oral and written form

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

V	**Practical Course Security, Usability and Society (Bachelor)**	**Practical course (P)**
	2512554, WS 20/21, 3 SWS, Language: German/English, Open in study portal	**Online**

Content

The internship "Security, Usability, and Society" covers topics such as user-friendly security and data protection programs as well as the implementation of user studies. The kick-off and the final presentations will be in English. The language of communication with the supervisor can - depending on the topic / supervisor - be German.

Important dates:

Kick-off: (mandatory) 3.11.2020, 10:00-11:30, online. Link: Microsoft Teams

Final submission: 14.03.2021, 23:59

Presentation: March 14, 2021

Topics:

Privacy-friendly apps

In this topic area, students complete an app (or an extension of an app) among our Privacy-Friendly Apps (PFA). 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.

- NoPhish 2.0
- Notes 2.0

Programming usable security measures

In this subject, students develop a part of coding, an extension, or another programming task dealing with various usable security interventions, eg as an extension. Some examples are TORPEDO (https://secuso.aifb.kit.edu/english/TORPEDO.php) orPassSec + (https://secuso.aifb.kit.edu/english/PassSecPlus.php). Just as for PFA, 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.

- Password Manager Enrolment Add-On
- Visualization app to explore Facebook behavioral data collection
- Portfolio Graphical Recognition-Based Passwords with Gamepads
- Implementation of an anti-phishing browser extension (English only)

Usable security user studies (online studies only)

These topics relate to setting up or analysing the results of user studies of various kinds. This year, due to the Corona outbreak, we decided to only run online studies. Otherwise interviews and laboratory tests would have been possible. At the end of the semester, the students present a report / work and a lecture in which they present their results.

- Investigating user reaction to password data breaches
- Expert feedback for an anti-phishing webpage template (English only)

Please, note that registration is not required to participate in the kick-off meeting.

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 Course Security, Usability and Society (Master)**	**Practical course (P)**
	2512555, WS 20/21, 3 SWS, Language: German/English, Open in study portal	**Online**

Content

The internship "Security, Usability, and Society" covers topics such as user-friendly security and data protection programs as well as the implementation of user studies. The kick-off and the final presentations will be in English. The language of communication with the supervisor can - depending on the topic / supervisor - be German.

Important dates:

Kick-off: (mandatory) 3.11.2020, 10:00-11:30, online. Link: Microsoft Teams

Final submission: 14.03.2021, 23:59

Presentation: March 14, 2021

Topics:

Privacy-friendly apps

In this topic area, students complete an app (or an extension of an app) among our Privacy-Friendly Apps (PFA). 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.

- NoPhish 2.0
- Notes 2.0

Programming usable security measures

In this subject, students develop a part of coding, an extension, or another programming task dealing with various usable security interventions, eg as an extension. Some examples are TORPEDO (https://secuso.aifb.kit.edu/english/TORPEDO.php) orPassSec + (https://secuso.aifb.kit.edu/english/PassSecPlus.php). Just as for PFA, 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.

- Password Manager Enrolment Add-On
- Visualization app to explore Facebook behavioral data collection
- Portfolio Graphical Recognition-Based Passwords with Gamepads
- Implementation of an anti-phishing browser extension (English only)

Execution of usable security user studies (online studies only)

These topics relate to setting up or analysing the results of user studies of various kinds. This year, due to the Corona outbreak, we decided to only run online studies. Otherwise interviews and laboratory tests would have been possible. At the end of the semester, the students present a report / work and a lecture in which they present their results.

- Investigating user reaction to password data breaches
- Expert feedback for an anti-phishing webpage template (English only)
- Implementing Zero-Trust Authentication Schemes

Please, note that registration is not required to participate in the kick-off meeting.

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)** 2612554, SS 2021, 3 SWS, Language: German/English, Open in study portal	**Practical course (P)** **Online**

Content

The internship "Security, Usability and Society" will cover topics both of usable security and privacy programming, and how to conduct user studies. This internship will be only in English. The kick-off, the presentations, and every written material to be graded must be in English. Communications with supervisors can be in German.
WiWi portal: https://portal.wiwi.kit.edu/ys/4628

Important dates:

Kick-off: 06.04.2021, 10:00-11:00 CET in Microsoft Teams - Link

Report + code submission : 07.09.2021, 23:59 CET

Presentation deadline : 20.09.2021, 23:59 CET

Presentation day: 24.09.2021, 09:00 CET

Topics:

Privacy Friendly apps

In this subject, 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.

- Notes 2.0

Programming Usable Security Intervention

In this subject, students develop a part of coding, an extension, or another programming task dealing with various usable security interventions, eg as an extension. Eg TORPEDO (https://secuso.aifb.kit.edu/english/TORPEDO.php) or PassSec + (https://secuso.aifb.kit.edu/english/PassSecPlus.php). Just as before, 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.

- Password Manager Enrolment Add-On
- Portfolio Graphical Recognition-Based Passwords with Gamepads
- Visualization app to explore Facebook behavioral data collection

Designing Security User studies (online studies only)

These topics are related to how to set up and conducting user studies of various types. This year, due to the Corona outbreak, we decided to conduct online studies only; otherwise, interviews and in lab studies would have been possible. At the end of the semester, the students present a report / paper and a talk in which they present their results.

- Neurotechnologies, Neuroprivacy, and User Acceptance
- Expert feedback for an anti-phishing webpage template (English only)
- "Your website has been hacked" - How to inform business owners about security issues on their webpages in more sensitive ways

Please, note that registration is not required to participate in the kick-off meeting.

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) .

T   5.4 Course: Advanced Object Orientation [T-INFO-101346]

Responsible: Prof. Dr.-Ing. Gregor Snelting
Organisation: KIT Department of Informatics
Part of: M-INFO-100809 - Advanced Object Orientation

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

T　5.5 Course: Advanced Topics in Economic Theory [T-WIWI-102609]

Responsible:	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 2021	2520527	Advanced Topics in Economic Theory	2 SWS	Lecture / 📱	Mitusch, Brumm
ST 2021	2520528	Übung zu Advanced Topics in Economic Theory	1 SWS	Practice / 📱	Pegorari

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**	**Lecture (V)**
	2520527, SS 2021, 2 SWS, Language: English, Open in study portal	**Online**

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 5.6 Course: Algorithmic Methods for Hard Optimization Problems [T-INFO-103334]

Responsible:	Prof. Dr. Dorothea Wagner
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101237 - Algorithmic Methods for Hard Optimization Problems

Type	Credits	Grading scale	Recurrence	Version
Oral examination	5	Grade to a third	Irregular	1

T 5.7 Course: Algorithms for Planar Graphs [T-INFO-101986]

Responsible:	Prof. Dr. Dorothea Wagner
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

Events					
ST 2021	24614	Algorithmen für planare Graphen (mit Übungen)	3 SWS	Lecture / Practice (/ 📱	Ueckerdt, Gottesbüren

Legend: 📱 Online, ❁ Blended (On-Site/Online), ❦ On-Site, ✗ Cancelled

T 5.8 Course: Algorithms I [T-INFO-100001]

Responsible: Prof. Dr. Peter Sanders
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 2021	24500	Algorithms I	4 SWS	Lecture / Practice (/ 🖥	Dachsbacher, Kleine Büning
Exams					
WT 20/21	7500291	Algorithms I			Dachsbacher

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🎤 On-Site, ✗ Cancelled

T   5.9 Course: Algorithms II [T-INFO-102020]

Responsible: Prof. Dr. Hartmut Prautzsch
             Prof. Dr. Peter Sanders
             Prof. Dr. Dorothea Wagner

Organisation: KIT Department of Informatics

Part of: M-INFO-101173 - Algorithms II

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

Events					
WT 20/21	24079	Algorithms II	4 SWS	Lecture / 📱	Sanders, Heuer, Seemaier
Exams					
WT 20/21	7500245	Algorithms II			Sanders
ST 2021	7500464	Algorithms II			Sanders

Legend: 📱 Online, ⚙ Blended (On-Site/Online), 👤 On-Site, ✗ Cancelled

T 5.10 Course: Analysis of Multivariate Data [T-WIWI-103063]

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

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

Exams			
WT 20/21	7900355	Analysis of Multivariate Data	Grothe

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.

T   5.11 Course: Applied Informatics – Applications of Artificial Intelligence [T-WIWI-110340]

Responsible:	Michael Färber
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101438 - Semantic Knowledge Management

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

Events					
WT 20/21	2511314	Applied Informatics - Applications of Artificial Intelligence	2 SWS	Lecture / 🖳	Färber, Käfer
WT 20/21	2511315	Exercises to Applied Informatics - Applications of Artificial Intelligence	1 SWS	Practice / 🖳	Färber, Käfer, Nguyen
Exams					
WT 20/21	7900091	Applied Informatics - Applications of Artificial Intelligence (Registration until 08 February 2021)			Sure-Vetter
ST 2021	7900009	Applied Informatics - Applications of AI (Registration until 12 July 2021)			Färber

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.

Annotation
Replaces from winter semester 2019/2020 T-WIWI-109263 "Applications of Artificial Intelligence".

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

V	**Applied Informatics - Applications of Artificial Intelligence** 2511314, WS 20/21, 2 SWS, Language: German, Open in study portal	Lecture (V) Online

Content

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

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

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

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

Learning objectives:

The students

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

Workload:

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

V	**Exercises to Applied Informatics - Applications of Artificial Intelligence** 2511315, WS 20/21, 1 SWS, Language: German, Open in study portal	**Practice (Ü)** **Online**

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 5.12 Course: Applied Informatics – Information Security [T-WIWI-110342]

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	3

Events

ST 2021	2511550	Applied Informatics - Information Security	2 SWS	Lecture / 🗎	Ghiglieri , Mayer
ST 2021	2511551	Exercise Applied Informatics - Information Security	1 SWS	Practice / 🗎	Berens

Exams

WT 20/21	7900074	Applied Informatics - Information Security (Registration until 08 February 2021)	Volkamer
ST 2021	7900064	Applied Informatics - Information Security (Registration until 12 July 2021)	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.

The exam takes place every semester and can be repeated at every regular examination date.

Annotation

Replaces from summer term 2020 T-WIWI-108387 "Information Security".

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

V	**Applied Informatics - Information Security** 2511550, SS 2021, 2 SWS, Open in study portal	Lecture (V) **Online**

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 - Information Security** 2511551, SS 2021, 1 SWS, Open in study portal	**Practice (Ü)** **Online**

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   5.13 Course: Applied Informatics – Modelling [T-WIWI-110338]

Responsible:	Michael Färber
	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	1

Events					
WT 20/21	2511030	Applied Informatics - Modelling	2 SWS	Lecture / ▯	Oberweis, Käfer, Schiefer
WT 20/21	2511031	Exercises to Applied Informatics - Modelling	1 SWS	Practice / ▯	Oberweis, Käfer, Schiefer
Exams					
WT 20/21	7900003	Applied Informatics - Modelling (Registration until 08 February 2021)			Oberweis, Sure-Vetter
ST 2021	7900018	Applied Informatics - Modelling (Registration until 12 July 2021)			Oberweis, Färber

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

Annotation

Replaces from winter semester 2019/2020 T-WIWI-102652 "Applied Informatics I - Modeling".

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

V	**Applied Informatics - Modelling** 2511030, WS 20/21, 2 SWS, Language: German, Open in study portal	Lecture (V) Online

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 description 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,
- model given problems in Description Logics and apply description logic rules,
- describe the main ontology concepts and languages and explain SPARQL queries,
- create and evaluate a relational database schema and express queries in relational algebra.

Workload:

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

Organizational issues

Im WS 20/21 gibt es keine festen Vorlesungszeiten, die Vorlesungsinhalte werden in Ilias bereitgestellt.

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:

- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, York Sure: Semantic Web - Grundlagen, Springer, 2008 (ISBN 978-3-540-33993-9)
- Staab, Studer: Handbook on Ontologies, Springer, 2003
- J.L. Peterson: Petri Net Theory and Modeling of Systems, Prentice Hall, 1981.
- Franz Baader, Diego Calvanese, Deborah McGuinness, Daniele Nardi, Peter Patel-Schneider. The Description Logic Handbook - Theory, Implementation and Applications, Cambridge 2003.


V	**Exercises to Applied Informatics - Modelling** 2511031, WS 20/21, 1 SWS, Language: German, Open in study portal	**Practice (Ü)** **Online**

Content

The exercises are related to the lecture Applied Informatics I - Modelling.

Multiple exercises are held that capture the topics, held in the lectureApplied Informatics I - Modelling, and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

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 description logics as a means of modelling static aspects will be explained. This will be complemented by the relational data model and the systematic design of databases based on ER models. For modelling dynamic aspects, different types of petri-nets together with their respective analysis techniques will be introduced.

Learning objectives:

Students

- explain the strengths and weaknesses of various modeling approaches for Information Systems and choose an appropriate method for a given problem,
- create UML models, ER models and Petri nets for given problems,
- model given problems in Description Logics and apply description logic rules,
- describe the main ontology concepts and languages and explain SPARQL queries,
- create and evaluate a relational database schema and express queries in relational algebra.

Organizational issues
Siehe zugehörige Vorlesung

- Online-Tutorium Dienstag   12-13:30 unter http://s.kit.edu/ai-m-dienstag
- Online-Tutorium Mittwoch   10-11:30 unter http://s.kit.edu/ai-m-mittwoch
- Online-Tutorium Donnerstag 10-11:30 unter http://s.kit.edu/ai-m-donnerstag

Beitritt zum Team unter http://connect.studium.kit.edu/teams/join/CC30tqrgen

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:

- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, York Sure: Semantic Web - Grundlagen, Springer, 2008 (ISBN 978-3-540-33993-9)
- Staab, Studer: Handbook on Ontologies, Springer, 2003
- J.L. Peterson: Petri Net Theory and Modeling of Systems, Prentice Hall, 1981.
- Franz Baader, Diego Calvanese, Deborah McGuinness, Daniele Nardi, Peter Patel-Schneider. The Description Logic Handbook - Theory, Implementation and Applications, Cambridge 2003.

5 COURSES

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

T 5.14 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	Each summer term	1

Events					
ST 2021	2511032	Applied Informatics - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services	2 SWS	Lecture / 📱	Sunyaev
ST 2021	2511033	Übungen zu Angewandte Informatik - Internet Computing	1 SWS	Practice / 📱	Sunyaev, Teigeler, Beyene
Exams					
WT 20/21	7900004	Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services (Registration until 08 February 2021)			Sunyaev
ST 2021	7900025	Applied Informatics - Internet Computing (Registration until 12 July 2021)			Sunyaev

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 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.

By successful processing the exercises a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Prerequisites

None

Recommendation

Knowledge of content of the modules Basic Notions of Computer Science and Algorithms I is expected.

Annotation

Replaces from winter semester 2019/2020 T-WIWI-109445 "Applied Informatics - Internet Computing".

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

V	**Applied Informatics - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services** 2511032, SS 2021, 2 SWS, Language: German, Open in study portal	Lecture (V) Online

5 COURSES

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

Content

The lecture Applied Computer Science II 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   5.15 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 2021	2560550	Auction and Mechanism Design	2 SWS	Lecture / 📱	Szech
ST 2021	2560551	Übung zu Auction and Mechanism Design	1 SWS	Practice / 📱	Szech, Huber
Exams					
WT 20/21	7900299	Exam Auction & Mechanism Design			Szech

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.

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

V	**Auction and Mechanism Design** 2560550, SS 2021, 2 SWS, Language: English, Open in study portal	Lecture (V) Online

Content

The course starts with the basic theory of equilibrium behavior and revenue management in one object standard auctions. The revenue equivalence theorem for standard auctions is introduced. Thereafter, the course focuses on mechanism design and its applications to one object auctions and bilateral trade.

The students

- learn to analyze strategic behavior in auctions;
- learn to compare auction formats with regard to efficiency and revenue;
- are familiarized with the basic theory of (Bayesian) mechanism design;
- learn to master the revenue equivalence theorem for standard auctions;
- learn to apply mechanism design to one object auctions and bilateral trade.

The lecture will be held in English.

It depends on the future pandemic development if the assessment will be in the form of an open-book-exam (Prüfungsleistung *anderer Art, SPO § 4 Abs. 2, Pkt. 3*) or in the form of a written exam (60 minutes) (SPO §4 (2), 1).
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Through successful participation in the Exercise, students can earn a bonus. If the grade on the written exam is between 4,0 and 1,3 the bonus improves the grade by one step (0,3 or 0,4). Details will be announced during the lecture.

The total workload for this course is approximately 135.0 hours. For further information see German version.

Recommendations:

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

Literature

Krishna, V.: Auction Theory, Academic Press, 2009.

Milgrom, P.: Putting Auction Theory to Work, Cambridge University Press, 2010.

Mathews, S.: A Technical Primer on Auction Theory I: Independent Private Values No. 1096. Northwestern University, Center for Mathematical Studies in Economics and Management Science, 1995.

T   5.16 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

Competence Certificate

The assessment is carried out (according to §4(2), 3 of the examination regulation) by the preparation and presentation of a sales presentation based on a use case (max 30 points) and a written open book exam (max 60 points). In total, a maximum of 90 points can be achieved during the course.

Further details on the case study and open book exam will be announced in the lecture.

Prerequisites

None.

Annotation

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

T   5.17 Course: Bachelor Thesis [T-WIWI-103095]

Responsible:	Prof. Dr. Sebastian Abeck
	Prof. Dr. Hagen Lindstädt
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101611 - Module Bachelor Thesis

Type	Credits	Grading scale	Version
Final Thesis	12	Grade to a third	1

Competence Certificate
see module description

Prerequisites
see module description

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

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

T   5.18 Course: Basic Notions of Computer Science [T-INFO-101964]

Responsible:	Dr. Sebastian Stüker Thomas Worsch
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101170 - Basic Notions of Computer Science M-WIWI-101528 - Orientation Exam

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

Events					
WT 20/21	24001	Basic Notions of Computer Science	3 SWS	Lecture / ⚙	Worsch
Exams					
WT 20/21	75400100	Basic Notions of Computer Science			Worsch
ST 2021	75400100	Basic Notions of Computer Science			Worsch

Legend: 📱 Online, ⚙ Blended (On-Site/Online), 🎤 On-Site, ✗ Cancelled

T   5.19 Course: Basic Notions of Computer Science Pass [T-INFO-101965]

Responsible:	Dr. Sebastian Stüker
	Thomas Worsch
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101170 - Basic Notions of Computer Science
	M-WIWI-101528 - Orientation Exam

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each winter term	1

Events					
WT 20/21	24002	Übungen zu Grundbegriffe der Informatik	1 SWS	Practice / 🧩	Worsch
Exams					
WT 20/21	7500191	Basic Notions of Computer Science I Pass			Worsch

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🎙 On-Site, ✗ Cancelled

T   5.20 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 2021	2560280	Basic Principles of Economic Policy	2 SWS	Lecture / ✘	Ott
ST 2021	2560281	Exercises of Basic Principles of Economic Policy	1 SWS	Practice / ✘	Ott, Scheu
Exams					
WT 20/21	7900079	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 in the summer semester 2021 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** 2560280, SS 2021, 2 SWS, Language: German, Open in study portal	**Lecture (V)** **Cancelled**

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]
Die Vorlesung wird im SoSe 2021 nicht gelesen. Die Prüfung findet statt. 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 2021, 1 SWS, Language: German, Open in study portal	Practice (Ü) **Cancelled**

Organizational issues

Zugehörige Veranstaltung: [2560280] Einführung in die Wirtschaftspolitik
Die Vorlesung und Übung wird im SoSe 2021 nicht gelesen. Die Prüfung findet statt. Vorbereitungsunterlagen finden Sie im Ilias - insbesondere die Video Übungsaufzeichnungen vom SoSe 2020 sind zur Verfügung gestellt.

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 5.21 Course: Basics of German Company Tax Law and Tax Planning [T-WIWI-108711]

Responsible:	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 20/21	2560134	Basics of German Company Tax Law and Tax Planning	3 SWS	Lecture / 🖥	Wigger, Gutekunst
Exams					
WT 20/21	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 in the summer semester 2021 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**	Lecture (V)
	2560134, WS 20/21, 3 SWS, Language: German, Open in study portal	**Online**

Content
Workload:

The total workload for this course is approximately 135.0 hours. For further information see German version.

Organizational issues
Montag 17:30:00-19:00 Uhr per MS-Teams-Livestream

(Achtung: In der ersten Vorlesungswoche beginnt die Veranstaltung um 18:00 Uhr)

T	**5.22 Course: Big Data Analytics [T-INFO-101305]**

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-101193 - Foundations of Information Systems
M-INFO-101193 - Foundations of Information Systems
M-INFO-101229 - Database Systems in Theory and Practice
M-INFO-101235 - Introduction to Data and Information Management

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

Events					
WT 20/21	24114	Big Data Analytics	3 SWS	Lecture / ✖	Böhm
Exams					
WT 20/21	7500087	Big Data Analytics			Böhm
ST 2021	7500078	Big Data Analytics			Böhm

Legend: 🖥 Online, ✖ Blended (On-Site/Online), 🔊 On-Site, ✗ Cancelled

T   5.23 Course: Big Data Analytics 2 [T-INFO-105742]

Responsible:	Prof. Dr.-Ing. Klemens Böhm
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101193 - Foundations of Information Systems

Type Oral examination	**Credits** 3	**Grading scale** Grade to a third	**Recurrence** Irregular	**Version** 1

Events					
ST 2021	2400042	Big Data Analytics 2	2 SWS	Lecture / 📱	Fouché
Exams					
WT 20/21	7500190	Big Data Analytics 2			Böhm
ST 2021	7500092	Big Data Analytics 2			Böhm

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🔊 On-Site, ✗ Cancelled

Prerequisites

| T | **5.24 Course: Business Administration: Finance and Accounting [T-WIWI-102819]** |

Responsible:	Prof. Dr. Martin Ruckes
	Prof. Dr. Marliese Uhrig-Homburg
	Prof. Dr. Marcus Wouters
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101491 - Foundations in Business Administration

Type Written examination	**Credits** 4	**Grading scale** Grade to a third	**Recurrence** Each winter term	**Version** 1

Events					
WT 20/21	2610026	Business Administration: Finance and Accounting	2 SWS	Lecture / 🗣	Ruckes, Wouters
WT 20/21	2610029		2 SWS	Tutorial (/ 🧩	Strych
Exams					
WT 20/21	7900368	Business Administration: Finance and Accounting			Wouters, Ruckes

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

Competence Certificate

The assessment consists of a written exam (90 min.) according to Section 4(2), 1 of the examination regulation.

The assessment 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 | **Business Administration: Finance and Accounting** 2610026, WS 20/21, 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 5.25 Course: Business Administration: Production Economics and Marketing [T-WIWI-102818]

Responsible:	Prof. Dr. Wolf Fichtner
	Prof. Dr. Martin Klarmann
	Prof. Dr.-Ing. Thomas Lützkendorf
	Prof. Dr. Martin Ruckes
	Prof. Dr. Frank Schultmann
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101492 - Business Administration

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

Events					
ST 2021	2500025	Tutorien zu BWL PM	2 SWS	Tutorial (/ 🖥	Klarmann, Strych, Assistenten
ST 2021	2600024	Business Administration: Production Economics and Marketing	2 SWS	Lecture / 🖥	Klarmann, Schultmann, Fichtner
Exams					
WT 20/21	7900317	Business Administration: Production Economics and Marketing			Schultmann, Klarmann

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🌐 On-Site, ✗ Cancelled

Competence Certificate
The assessment consists of a written exam (90 minutes) according to Section 4(2), 1 of the examination regulation.

Prerequisites
None

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

V	**Business Administration: Production Economics and Marketing**	Lecture (V)
	2600024, SS 2021, 2 SWS, Language: German, Open in study portal	Online

Content

The course is composed of the sub-areas:

1. Marketing:

Marketing aims at the optimal design of situations that arise in the context of economic activity in the satisfaction of needs and desires (e.g. marketing of company services, soliciting understanding of group interests, distribution of public funds, implementation of economic policy goals).

Topics dealt with in detail:

- Market research (e.g. product positioning, market segmentation)
- behavioural research (e.g. influence of socio-cultural and physical environmental aspects)
- Marketing policy instruments (e.g. product, price, communication and distribution policy),
- Special features of international marketing activities (e.g. advantages and risks in international exchange relations),
- Entrepreneurship and intrapreneurship (e.g. marketing of innovations by company founders vs. established companies)

2. Production Economy:

This subfield provides an initial introduction to all operational tasks related to the production of tangible and intangible goods. In addition to the manufacturing industry (basic and capital goods, capital goods and consumer goods, food and beverages, i.e. production industry in the broadest sense), the energy industry, construction and real estate industry and labour sciences are also considered.

Topics dealt with in detail:

- Introduction to the subfield (system theoretical classification, general tasks, cross-sectional topics)
- Industrial production (location planning, transport planning, procurement, plant management, production management)
- Electricity industry (energy demand and supply, energy system planning, technological foresight, cost structures)
- Construction and real estate industry

3. Information Systems:

Information represents a competitive factor in today's economy, which requires an interdisciplinary view of the research fields of economics, information technology and law. In this subfield, selected fundamentals of Business Information Systems and their role in today's competition are presented.
Examples from practice motivate and complement the topics.

Treated topics in detail:

- Trends in Information Systems
- Definition of terms data, information, knowledge
- Information in companies: Production and competitive factor
- Information processing: from agent to corporate network
- Company networks
- Service Value Networks
- market engineering
- social networks and services

Literature

Ausführliche Literaturhinweise werden gegeben in den Materialen zur Vorlesung.

T 5.26 Course: Business Process Modelling [T-WIWI-102697]

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

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

Events					
WT 20/21	2511210	Business Process Modelling	2 SWS	Lecture / 🖳	Oberweis
WT 20/21	2511211	Exercise Business Process Modelling	1 SWS	Practice / 🖳	Oberweis, Schüler, Schreiber

Exams				
WT 20/21	7900015	Business Process Modelling (Registration until 08 February 2021)		Oberweis
ST 2021	7900047	Business Process Modelling (Registration until 12 July 2021)		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 20/21, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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	**5.27 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
	M-WIWI-101465 - Topics in Finance I

Type Written examination	**Credits** 3	**Grading scale** Grade to a third	**Recurrence** Each winter term	**Version** 1

Events					
WT 20/21	2530299	Business Strategies of Banks	2 SWS	Lecture / 🎤	Müller
ST 2021	2530299	Business Strategies of Banks	2 SWS	Lecture / 🎤	Müller
Exams					
WT 20/21	7900064	Business Strategies of Banks			Müller, Ruckes

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🎤 On-Site, ✖ Cancelled

Competence Certificate
See German version.

Prerequisites
None

Recommendation
None

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

V	**Business Strategies of Banks** 2530299, WS 20/21, 2 SWS, Language: German, Open in study portal	**Lecture (V) On-Site**

Content
The management of a bank is in charge of the determination and implementation of business policy - taking into account all relevant endogenous and exogenous factors - that assures the bank's success in the long run. In this context, there exists a large body of banking models and theories which are helpful in describing the success and risk of a bank. This course is meant to be the bridging of banking theory and practical implementation. In the course of the lectures students will learn to take on the bank management's perspective.
The first chapter deals with the development of the banking sector. Making use of appropriate assumptions, a banking policy is developed in the second chapter. The design of bank services (ch. 3) and the adequate marketing plan (ch. 4) are then built on this framework. The operational business of banks must be guided by appropriate risk and earnings management (ch. 5 and 6), which are part of the overall (global) bank management (ch. 7). Chapter eight, at last, deals with the requirements and demands of bank supervision as they have significant impact on a bank's corporate policy.

Learning outcomes:

Students are are in a position to discuss the principles of commercial banking. They are familiar with fundamental concepts of bank management and are able to apply them.

Workload:

The total workload for this course is approximately 90 hours. For further information see the German version.

Literature
Weiterführende Literatur:

- Ein Skript wird im Verlauf der Veranstaltung kapitelweise ausgeteilt.
- Hartmann-Wendels, Thomas; Pfingsten, Andreas; Weber, Martin; 2014, Bankbetriebslehre, 6. Auflage, Springer

| **V** | **Business Strategies of Banks**
2530299, SS 2021, 2 SWS, Language: German, Open in study portal | **Lecture (V)**
On-Site |

Literature
Weiterführende Literatur:

- Ein Skript wird im Verlauf der Veranstaltung kapitelweise ausgeteilt.
- Hartmann-Wendels, Thomas; Pfingsten, Andreas; Weber, Martin; 2014, Bankbetriebslehre, 6. Auflage, Springer

T 5.28 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 20/21	24012	Civil Law for Beginners	4 SWS	Lecture / ▤	Matz
Exams					
WT 20/21	7500012	Civil Law for Beginners			Matz, Dreier
ST 2021	7500041	Civil Law for Beginners			Dreier, Matz

Legend: ▤ Online, ⚄ Blended (On-Site/Online), ◉ On-Site, ✗ Cancelled

T 5.29 Course: Cognitive Systems [T-INFO-101356]

Responsible:	Prof. Dr. Gerhard Neumann
	Prof. Dr. Alexander Waibel
Organisation:	KIT Department of Informatics
Part of:	M-INFO-100819 - Cognitive Systems

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

Events					
ST 2021	24572	Kognitive Systeme	4 SWS	Lecture / Practice (/ 📱	Waibel, Stüker, Neumann
Exams					
WT 20/21	7500277	Cognitive Systems Waibel/Neumann			Waibel, Neumann
ST 2021	7500157	Cognitive Systems			Waibel, Neumann

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 👤 On-Site, ✗ Cancelled

T   5.30 Course: Competition in Networks [T-WIWI-100005]

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

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

Exams			
WT 20/21	7900335	Competition in Networks	Mitusch

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.

Annotation
Due to the research semester of Prof. Mitusch the course will not be offered in the winter semester 20/21. An examination will be offered in each semester.

T 5.31 Course: Computer Architecture [T-INFO-101355]

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

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

Events					
ST 2021	2424570	Computer structures	3 SWS	Lecture / 📱	Karl
Exams					
WT 20/21	7500034	Computer Architecture			Karl
ST 2021	7500190	Computer Architecture			Karl

Legend: 📱 Online, ✥ Blended (On-Site/Online), ● On-Site, ✕ Cancelled

T **5.32 Course: Computer Organization [T-INFO-103531]**

Responsible:	Prof. Dr. Wolfgang Karl
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101836 - Computer Engineering

Type	Credits	Grading scale	Version
Written examination	6	Grade to a third	1

Events					
WT 20/21	24502	Computer Organization	3 SWS	Lecture / ▯	Henkel, Bauer, Lehmann
WT 20/21	24505	Übungen zu Rechnerorganisation	2 SWS	Practice / ▯	Henkel, Lehmann
Exams					
WT 20/21	7500228	Computer Organization			Karl, Henkel

Legend: ▯ Online, ✧ Blended (On-Site/Online), ● On-Site, ✗ Cancelled

T   5.33 Course: Consulting in Practice [T-INFO-101975]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-101193 - Foundations of Information Systems
M-INFO-101235 - Introduction to Data and Information Management

Type Completed coursework	Credits 1,5	Grading scale pass/fail	Recurrence Irregular	Version 1

Events					
WT 20/21	24664	Praxis der Unternehmensberatung	2 SWS	Lecture / 🖥	Böhm, Lang
Exams					
WT 20/21	7500308	Consulting in Practice			Böhm

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🔊 On-Site, ✗ Cancelled

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

V   Praxis der Unternehmensberatung
24664, WS 20/21, 2 SWS, Open in study portal

**Lecture (V)
Online**

Content
The market for consulting sevices grows annually by 20% and is therefore one of the leading growth sectors and professional fields in the future. This trend is in particular driven by the IT industry. Here, widely used standard software moves the focus of the future professional field from software development to consulting. In this context, consulting services have usually a broad definition, reaching from pure IT-focused consulting (e.g., deployment of SAP) to strategic consulting (strategy, organisation etc). In contrast to common rumors, a qualification in business studies is not a must. This opens up a diversified and exciting field with exceptional development perspectives for computer science students. The copurse deals thematically with the two fields consulting in general and function-specific consulting (with IT consulting as an example).

The structure of the course is oriented along the phases of a consulting project:

- Diagnosis: The consultant as an analytic problem solver.
- Strategic adjustment/redesign of the core processes: Optimisation/redesign of essential business functionality to solve the diagnosed problems in cooperation with the client.
- Implementation: Installation of the solutions in the clients`s organisation for assuring the implementation.

Emphasised topics in the course are:

- Elementary problem solving: Problem definition, structuring of problems and focussing through the usage of tools (e.g., logic and hypothesis trees), creative techniques, solution systems etc.
- Obtaining information effectively: Access of information sources, interview techniques etc.
- Effective communication of findings/recommendations. Analysis/planning of communication (media, audience, formats), communication styles (e.g., top-down vs. bottom-up), special topics (e.g., arrangement of complex information) etc.
- Efficient teamwork: Tools for optimising efficient work, collaboration with clients, intellectual and process leadership in the team etc.

At the end of the course, the participants

- have gained knowledge and understanding for the activities of the consulting process in general,
- have gained function-specific knowledge and understanding of IT consulting,
- have an overview about consulting companies,
- know concrete consulting examples,
- have experienced how effective teams work and
- have got an insight into the professional field "consulting".

Organizational issues
Die Teilnehmeranzahl ist limitiert. Eine Anmeldung per Mail an sekretariat.boehm@ipd.kit.edu ist erforderlich.

Die Veranstaltung findet komplett online statt. Link zur Veranstaltung: https://i40meet.ipd.kit.edu/pdub

T   5.34 Course: Data and Storage Management [T-INFO-101276]

Responsible:	Prof. Dr. Bernhard Neumair
Organisation:	KIT Department of Informatics
Part of:	M-WIWI-101440 - Information Services in Networks

Type Oral examination	**Credits** 4	**Grading scale** Grade to a third	**Recurrence** Each winter term	**Version** 1

Events					
WT 20/21	24074	Data and Storage Management	2 SWS	Lecture / 🖬	Neumair
Exams					
WT 20/21	7500112	Data and Storage Management			Neumair

Legend: 🖬 Online, ⚙ Blended (On-Site/Online), 🎙 On-Site, ✗ Cancelled

T   5.35 Course: Data Mining and Applications [T-WIWI-103066]

Responsible:	Rheza Nakhaeizadeh
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101599 - Statistics and Econometrics

Type	Credits	Grading scale	Recurrence	Version
Oral examination	4,5	Grade to a third	see Annotations	2

Events					
ST 2021	2520375	Data Mining and Applications	2 SWS	Lecture / 📱	Nakhaeizadeh

Legend: 📱 Online, ⚄ Blended (On-Site/Online), ◕ On-Site, ✗ Cancelled

Competence Certificate
The course will be held for the last time in the summer semester 2021. The last exam opportunity for first-timers will be in the summer semester 2021. A last exam opportunity (for repeaters only) will be offered in the winter semester 2021/2022.

- Conduction of a larger emprical study in groups
- reporting of milestones
- final presentation (app. 45 minutes)

Prerequisites
None

Annotation
The course will be held for the last time in the summer semester of 2021.

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

V	**Data Mining and Applications**	**Lecture (V)**
	2520375, SS 2021, 2 SWS, Language: German, Open in study portal	**Online**

Content
Learning objectives:

Students

- know the definition of Data Mining
- are familiar with the CRISP-DM
- are familiar with the most important Data Mining Algorithms like Decision Tree, K-Means, Artificial Neural Networks, Association Rules, Regression Analysis
- will be able to use a DM-Tool

Content:

Part one: Data Mining:

What is Data Mining?; History of Data Mining; Conferences and Journals on Data Mining; Potential Applications; Data Mining Process; Business Understanding; Data Understanding; Data Preparation; Modeling; Evaluation; Deployment; Interdisciplinary aspects of Data Mining; Data Mining tasks; Data Mining Algorithms (Decision Trees, Association Rules, Regression, Clustering, Neural Networks); Fuzzy Mining; OLAP and Data Warehouse; Data Mining Tools; Trends in Data Mining

Part two: Examples of application of Data Mining

Success parameters of Data Mining Projects; Application in industry; Application in Commerce

Workload:

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

Exam preparation: 40 hours

Exam preparation: 40 hours

Organizational issues
Blockveranstaltung, Termine werden über ILIAS bekannt gegeben

Literature
U. Fayyad, G. Piatetsky-Shapiro, P. Smyth, R. Uthurusamy, editors, Advances in Knowledge Discovery and Data Mining, AAAI/MIT Press, 1996 (order online from Amazon.com or from MIT Press).

Jiawei Han, Micheline Kamber, Data Mining : Concepts and Techniques, 2nd edition, Morgan Kaufmann, ISBN 1558609016 , 2006.

David J. Hand, Heikki Mannila and Padhraic Smyth, Principles of Data Mining , MIT Press, Fall 2000

Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Springer Verlag, 2001.

Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Addison wesley (May, 2005). Hardcover: 769 pages. ISBN: 0321321367

Ripley, B.D. (1996) Pattern Recognition and Neural Networks, Cambridge: Cambridge University Press.

Ian Witten and Eibe Frank, Data Mining: Practical Machine Learning Tools and Techniques, 2nd Edition, Morgan Kaufmann, ISBN 0120884070 , 2005.

T 5.36 Course: Database Systems [T-INFO-101497]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-101178 - Communication and Database Systems
                     M-INFO-101235 - Introduction to Data and Information Management

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

Events					
ST 2021	24516	Datenbanksysteme	2 SWS	Lecture / 🖥	Böhm, Mülle
ST 2021	24522	Übungen zu Datenbanksysteme	1 SWS	Practice / 🖥	Böhm, Mülle
Exams					
WT 20/21	7500189	Database Systems			Böhm
ST 2021	7500166	Database Systems			Böhm

Legend: 🖥 Online, ⊗ Blended (On-Site/Online), ● On-Site, ✗ Cancelled

T   5.37 Course: Decision Theory [T-WIWI-102792]

Responsible:	Prof. Dr. Karl-Martin Ehrhart
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 summer term	1

Events					
ST 2021	2520365	Decision Theory	2 SWS	Lecture / 🖥	Ehrhart
ST 2021	2520366	Übungen zu Entscheidungstheorie	1 SWS	Practice / 🖥	Ehrhart
Exams					
WT 20/21	7900348	Decision Theory			Ehrhart

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
Knowledge in mathematics and statistics is required.

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

V   Decision Theory
2520365, SS 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

Literature

- Ehrhart, K.-M. und S.K. Berninghaus (2012): Skript zur Vorlesung Entscheidungstheorie, KIT.
- Hirshleifer und Riley (1997): The Analytics of Uncertainty and Information. London: Cambridge University Press, 4. Aufl.
- Berninghaus, S.K., K.-M. Ehrhart und W. Güth (2006): Strategische Spiele. Berlin u.a.: Springer, 2., überarbeitete und erweiterte Aufl. (oder erste Auflage, 2002)

| T | **5.38 Course: Deployment of Database Systems [T-INFO-101317]** |

Responsible:	Prof. Dr.-Ing. Klemens Böhm
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101193 - Foundations of Information Systems
	M-INFO-101193 - Foundations of Information Systems
	M-INFO-101229 - Database Systems in Theory and Practice
	M-INFO-101235 - Introduction to Data and Information Management

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

Events					
WT 20/21	2400020	Datenbankeinsatz	3 SWS	Lecture / ⚙	Böhm
Exams					
WT 20/21	7500007	Deployment of Database Systems			Böhm
ST 2021	7500090	Deployment of Database Systems			Böhm

Legend: 📱 Online, ⚙ Blended (On-Site/Online), ✊ On-Site, ✗ Cancelled

T 5.39 Course: Derivatives [T-WIWI-102643]

Responsible:	Prof. Dr. Marliese Uhrig-Homburg
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101402 - eFinance
	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 summer term	1

Events					
ST 2021	2530550	Derivatives	2 SWS	Lecture / 🖥	Uhrig-Homburg
ST 2021	2530551	Übung zu Derivate	1 SWS	Practice / 🖥	Uhrig-Homburg, Eska
Exams					
WT 20/21	7900051	Derivatives			Uhrig-Homburg

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🌐 On-Site, ✗ Cancelled

Competence Certificate
Depending on further pandemic developments, the examination will be offered in the summer semester 2021 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
None

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

V **Derivatives**	Lecture (V)
2530550, SS 2021, 2 SWS, Language: German, Open in study portal	Online

Organizational issues
Veranstaltungskonzept umfasst vollständige Aufzeichnungen von Vorlesung und Übung. Ergänzend bieten wir zweiwöchig freiwillige Live-Fragerunden zum fachlichen und organisatorischen Austausch an.

Literature

- Hull (2012): Options, Futures, & Other Derivatives, Prentice Hall, 8th Edition

Weiterführende Literatur:

Cox/Rubinstein (1985): Option Markets, Prentice Hall

T   5.40 Course: Design, Construction and Sustainability Assessment of Buildings I [T-WIWI-102742]

Responsible:	Prof. Dr.-Ing. Thomas Lützkendorf
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101467 - Design, Construction and Sustainability Assessment of Buildings

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

Events					
WT 20/21	2586404	Design and Construction of Buildings	2 SWS	Lecture / ▯	Lützkendorf
WT 20/21	2586405	Übung zu Bauökologie I	1 SWS	Practice / ▯	N.N.
Exams					
WT 20/21	7900247	Design, Construction and Sustainability Assessment of Buildings I			Lützkendorf
WT 20/21	7900248	Design, Construction and Sustainability Assessment of Buildings I			Lützkendorf

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 two times only in the semester in which the lecture is takes place (winter semester). Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Recommendation
A combination with the module *Real Estate Management* and with engineering science modules in the area of building physics and structural design is recommended.

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

V	**Design and Construction of Buildings** 2586404, WS 20/21, 2 SWS, Language: German, Open in study portal	**Lecture (V)** **Online**

Content

Taking low-energy buildings as an example the course is an introduction to cheap, energy-efficient, resource-saving and health-supporting design, construction and operation of buildings. Questions of the implementation of the principles of a sustainable development within the building sector are discussed on the levels of the whole building, its components, building equipment as well as the materials. Besides technical interrelationships basics dimensioning and various approaches to ecological and economical assessment play a role during the lectures, as well as the different roles of people involved into the building process. Topics are the integration of economical and ecological aspects into the design process, strategies of energy supply, low-energy and passive buildings, active and passive use of solar energy, selection and assessment of construction details, selection and assessment of insulation materials, greened roofs plus health and comfort.

Recommendations:

A combination with the module *Real Estate Management* [WW3BWLUO1] and with engineering science modules in the area of building physics and structural design is recommended.

The student

- has an in-depth knowledge of aspects of energy-saving, resource-saving and health-oriented design, construction and operation of buildings (design for environment)
- has a critical understanding of the essential requirements, concepts and technical solutions for green buildings
- is able to integrate aspects of energy-saving, resource-saving and health-conscious construction into a holistic environmental design approach and to assess the advantages and disadvantages of different individual solutions.

The total workload for this course is approximately 135.0 hours. For further information see German version.

The **assessment** consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place two times only in the semester in which the lecture is takes place (winter semester). Re-examinations are offered at every ordinary examination date.

Literature
Weiterführende Literatur:

- Umweltbundesamt (Hrsg.): "Leitfaden zum ökologisch orientierten Bauen". C.F.Müller 1997
- IBO (Hrsg.): "Ökologie der Dämmstoffe". Springer 2000
- Feist (Hrsg.): "Das Niedrigenergiehaus – Standard für energiebewusstes Bauen". C.F.Müller 1998
- Bundesarchitektenkammer (Hrsg.): "Energiegerechtes Bauen und Modernisieren". Birkhäuser 1996
- Schulze-Darup: "Bauökologie". Bauverlag 1996

T 5.41 Course: Design, Construction and Sustainability Assessment of Buildings II [T-WIWI-102743]

Responsible: Prof. Dr.-Ing. Thomas Lützkendorf
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101467 - Design, Construction and Sustainability Assessment of Buildings

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

Events					
ST 2021	2585403	Übung zu Bauökologie II	1 SWS	Practice / 🖥	Rochlitzer
ST 2021	2585404	Sustainability Assessment of Buildings	2 SWS	Lecture / 🖥	Lützkendorf

Legend: 🖥 Online, ⚄ Blended (On-Site/Online), 🎤 On-Site, ✗ Cancelled

Competence Certificate
Depending on further pandemic developments, the exam will be offered in the summer semester 2021 either as a 60-minute upload exam (Open Book Exam @ Home), or as a 60-minute exam (written exam according to SPO § 4 Abs. 2, Pkt. 1).

Prerequisites
None

Recommendation
A combination with the module *Real Estate Management* and with engineering science modules from the areas building physics and structural designis recommended.

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

V Sustainability Assessment of Buildings
2585404, SS 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

Content
The course identifies problems concerning the economical and environmental assessment of buildings along their lifecycle and discusses suitable procedures and tools supporting the decision making process. For example, the course addresses topics like operating costs, heat cost allocation, comparisons of heating costs, applied economical assessment methods, life cycle assessment as well as related design and assessment tools (e.g. element catalogues, databases, emblems, tools) and assessment procedures (e.g. carbon footprint, MIPS, KEA), which are currently available.

Recommendations:

A combination with the module *Real Estate Management* [WW3BWLOOW2] and with engineering science modules from the areas building physics and structural designis recommended.

The student

- has an in-depth knowledge of the classification of environmental design and construction of buildings within the overall context of sustainability
- has a critical understanding of the main theories and methods of assessing the environmental performance of buildings
- is able to use methods and tools to evaluate the environmental performance in design and decision processes or to interpret existing results

The total workload for this course is approximately 135.0 hours. For further information see German version.

The **assessment** consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place two times only in the semester in which the lecture is takes place (summer semester). Re-examinations are offered at every ordinary examination date.

Literature
Weiterführende Literatur:

- Schmidt-Bleek: "Das MIPS-Konzept". Droemer 1998
- Wackernagel et.al: "Unser ökologischer Fußabdruck". Birkhäuser 1997
- Braunschweig: "Methode der ökologischen Knappheit". BUWAL 1997
- Hohmeyer et al.: "Social Costs and Sustainability". Springer 1997
- Hofstetter: "Perspectives in Life Cycle Impact Assessment". Kluwer Academic Publishers 1998

T   5.42 Course: Digital Circuits Design [T-INFO-103469]

Responsible: Prof. Dr. Wolfgang Karl
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 2021	24007	Digital Circuits Design	3 SWS	Lecture / 📱	Tahoori
Exams					
WT 20/21	7500254	Digital Circuits Design			Henkel, Karl, Tahoori
ST 2021	7500254	Digital Circuits Design			Henkel, Karl, Tahoori

Legend: 📱 Online, ⚃ Blended (On-Site/Online), ♟ On-Site, ✗ Cancelled

T   5.43 Course: Digital Services: Foundations [T-WIWI-111307]

Responsible:	Prof. Dr. Gerhard Satzger
	Prof. Dr. Christof Weinhardt
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101434 - eBusiness and Service Management
	M-WIWI-102752 - Fundamentals of Digital Service Systems

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

Events					
ST 2021	2595466	Digital Services: Foundations	2 SWS	Lecture / 📱	Satzger, Weinhardt, Kühl
ST 2021	2595467	Exercise Digital Services: Foundations	1 SWS	Practice / 📱	Kühl, Schöffer, Badewitz

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). By successful completion of the exercises (§4(2), 3 SPO 2007 respectively §4(3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Prerequisites

see below

Annotation

This course replaces T-WIWI-109938 "Digital Services".

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

V   Digital Services: Foundations
2595466, SS 2021, 2 SWS, Language: English, Open in study portal

Lecture (V)
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, cloud and cloud labor services, web services, service innovation, service analytics, digital economics, as well as the transformation and coordination of service value networks. Additionally, case studies, hands-on exercises, and guest lectures will illustrate the relevance of digital services in today's world. This course is held in English to acquaint students with international environments.

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 20/21	2560137	Economics and Behavior	2 SWS	Lecture / ▤	Szech, Ehrlich, Zhao
WT 20/21	2560138	Übung zu Economics and Behavior	1 SWS	Practice / ▤	Szech, Zhao, Huber
Exams					
WT 20/21	7900134	Exam Economics and Behavior			Szech
WT 20/21	7900135	Exam Economics and Behavior (2)			Szech

Legend: ▤ Online, ⚄ Blended (On-Site/Online), ◕ On-Site, ✗ Cancelled

Competence Certificate
The exam form in winter term 20/21 cannot be determined yet due to the Corona pandemic.
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**	Lecture (V)
	2560137, WS 20/21, 2 SWS, Language: English, Open in study portal	**Online**

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.

Ariely, Dan: Predictably Irrational. New York: HarperCollins, 2008.

Ariely, Dan: The Upside of Irrationality. New York: HarperCollins 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
	M-WIWI-101528 - Orientation Exam

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

Events					
WT 20/21	2610012	Economics I: Microeconomics	3 SWS	Lecture / 🎤	Reiß
Exams					
WT 20/21	7910001	Economics I: Micro (Online Exam)			Reiß
WT 20/21	7910002	Economics I: Micro (Offline Exam)			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 20/21, 3 SWS, Language: German, Open in study portal	Lecture (V) On-Site

Content

The students learn the basic concepts in Microeconomics and some basics in game theory. The student will understand the working of markets in modern economies and the role of decision making. Furthermore, she should be able to understand simple game theoretic argumentation in different fields of Economics.

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

It is the main aim of this course 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.

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 lecture.

The re-examination is offered at the same examination period. Usually, 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.

The total workload for this course is approximately 150 hours.

Literature

- H. Varian, Grundzüge der Mikroökonomik, 5. Auflage (2001), Oldenburg Verlag
- Pindyck, Robert S./Rubinfeld, Daniel L., Mikroökonomie, 6. Aufl., Pearson. Münschen, 2005
- Frank, Robert H., Microeconomics and Behavior, 5. Aufl., McGraw-Hill, New York, 2005

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	1

Events					
ST 2021	2520016	Economics III: Introduction to Econometrics	2 SWS	Lecture / 📱	Schienle, Rüter
ST 2021	2520017	Übungen zu VWL III	2 SWS	Practice / 📱	Schienle, Rüter, Görgen

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🌐 On-Site, ✗ Cancelled

Competence Certificate
Depending on further pandemic developments, the examination will be offered in the summer semester 2021 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 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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-101402 - eFinance
	M-WIWI-101423 - Topics in Finance II
	M-WIWI-101434 - eBusiness and Service Management
	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 20/21	2540454	eFinance: Information Systems for Securities Trading	2 SWS	Lecture / 📱	Weinhardt, Notheisen
WT 20/21	2540455	Übungen zu eFinance: Informationssysteme für den Wertpapierhandel	1 SWS	Practice / ⚙	Jaquart
Exams					
WT 20/21	7900182	eFinance: Information Engineering and Management for Securities Trading		Weinhardt	
WT 20/21	7900309	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.

Prerequisites
see below

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.

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

V eFinance: Information Systems for Securities Trading
2540454, WS 20/21, 2 SWS, Language: English, Open in study portal

Lecture (V)
Online

Content
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.

Literature

- Maureen O'Hara: Market Microstructure Theory (1997, Blackwell Publishing)
- Larry Harris: Trading and Exchanges – Market Microstructure for Practitioners (2004, Oxford University Press)

Further Literature

- Joel Hasbrouck: Empirical Market Microstructure (2007, Oxford University Press)
- Thierry Foucault, Marco Pagano, and Ailsa Roell: Market Liquidity: Theory, Evidence, and Policy (2013, Oxford University Press)

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

Events					
ST 2021	2581959	Energy Policy	2 SWS	Lecture / 🖥	Wietschel
Exams					
WT 20/21	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 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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: Exercises in Civil Law [T-INFO-102013]

Responsible:	Prof. Dr. Thomas Dreier
	Dr. Yvonne Matz
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101191 - Commercial Law

Type Examination of another type	**Credits** 9	**Grading scale** Grade to a third	**Recurrence** Each term	**Version** 2

Events					
WT 20/21	24011	Commercial and Corporate Law	2 SWS	Lecture / 🖥	Wiele
WT 20/21	24017	Exercises in Civil Law	2 SWS	Lecture / ✿	Dreier, Käde
ST 2021	24504	Advanced Civil Law	2 SWS	Lecture / 🖥	Matz
ST 2021	24506	Exercises in Civil Law	2 SWS	Lecture / 🖥	Dreier
ST 2021	24926	Case Studies in Civil Law	2 SWS	Practice / 🖥	Käde, Hägle
Exams					
WT 20/21	7500108	Commercial Law			Dreier, Matz
ST 2021	7500099	Wirtschaftsprivatrecht			Dreier, Matz

Legend: 🖥 Online, ✿ Blended (On-Site/Online), ◕ On-Site, ✗ Cancelled

T 5.50 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-101413 - Applications of Operations Research
	M-WIWI-101421 - Supply Chain Management
	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 20/21	2550486	Facility Location and Strategic Supply Chain Management	2 SWS	Lecture / 📱	Nickel
WT 20/21	2550487	Übungen zu Standortplanung und strategisches SCM	1 SWS	Practice / 📱	Pomes
Exams					
WT 20/21	00043	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 20/21, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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 5.51 Course: Financial Accounting and Cost Accounting [T-WIWI-102816]

Responsible:	Dr. Jan-Oliver Strych
Organisation:	KIT Department of Informatics
	KIT Department of Economics and Management
Part of:	M-WIWI-101492 - Business Administration

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

Events					
WT 20/21	2600002		2 SWS	Lecture / 🖥	Strych
WT 20/21	2600003	Übung zu Rechnungswesen	2 SWS	Practice / 🖥	Strych
Exams					
WT 20/21	7900369	Financial Accounting and Cost Accounting			Ruckes

Legend: 🖥 Online, ⚗ Blended (On-Site/Online), 🎤 On-Site, ✗ Cancelled

Competence Certificate
The assessment consists of a written exam following §4, Abs. 2, 1 of the examination regulation.
The examination 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	2600002, WS 20/21, 2 SWS, Open in study portal	Lecture (V) Online

Literature
Coenenberg, Haller und Schultze (2014): Jahresabschluss und Jahresabschlussanalyse, 23. Auflage. Stuttgart: Schäffer-Poeschel.
Hawawini and Viallet (2011): Finance for Executives: Managing for Value Creation. South-Western Cencage Learning.

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 20/21	2530242	Financial Accounting for Global Firms	2 SWS	Lecture / 🖥	Luedecke
WT 20/21	2530243	Tutorial - Financial Accounting for Global Firms	1 SWS	Practice / 🖥	Luedecke
Exams					
WT 20/21	7900142	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.

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

V	**Financial Accounting for Global Firms** 2530242, WS 20/21, 2 SWS, Language: English, Open in study portal	**Lecture (V)** **Online**

Content

Increasing globalization coupled with related regulations continues to put pressure on moving towards a common global accounting framework - International Financial Reporting Standards (IFRS). Currently, more than 140 countries use IFRS, so if a firm's business include global transactions, it is critical to know about the impact of IFRS on the financial reporting process and business. In the EU, IFRS are compulsory for listed companies's consolidated statements but have also gained factual significance for companies without statutory duty to use IFRS. The course introduces the conceptual framework of IFRS, discuss the primary financial statements according to IFRS and explains the underlying principles, concepts, and methods to prepare the financial statements. Special focus is given to some more complex accounting issues related to revenue recognition from contracts with customers, consolidation of different types of intercorporate investments, and foreign currency translation.

The lecture covers the following topics:

- The context of financial accounting for global firms
- The mechanics of financial accounting
- Accounting frameworks and concepts
- Content and presentation of financial statements
- Preparing financial statements
- Revenue recognition from contracts
- Tangible and intangible non-current assets
- Financial assets, liabilities, and equity
- Consolidation and the assessment of control
- Investment in associates and joint arrangements
- Business combinations
- Foreign currency translation

Learning outcomes: Students

- understand the IFRS conceptual framework and its significance for global firms,
- are able to read and interpret IFRS compliant financial statements,
- know about key differences between IFRS and U.S. GAAP and its impact on financial reporting,
- can apply the multi-step model for the recognition of revenues from contracts with customers,
- are able to evaluate alternative measurement bases for assets and liabilities,
- are able to classify intercorporate investments by the concept of control and to apply the appropriate accounting method,
- know about the impact of foreign exchange translation on financial statements.

Organizational issues

Zur Vorlesung wird eine 14-tägige Übung angeboten.

Literature

Alexander, D. and C. Nobes (2020): Financial Accounting – An International Introduction, 7th ed., Pearson.

Coenenberg, A.G., Haller, A. und W. Schultze (2018): Jahresabschluss und Jahresabschlussanalyse, 25. 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	see Annotations	1

Competence Certificate

The module examination is an alternative exam assessment and consists of two parts in which a maximum of 100 points can be achieved:

In the first part of the examination, a maximum of 30 points can be achieved, which are distributed equally weighted over eight worksheets to be submitted during the semester. The worksheets of the first three weeks are representative for all following worksheets in terms of scope and degree of difficulty. With the beginning of the 4th week of the course, the handing in of the worksheets is considered to be part of the alternative exam assessment.

A maximum of 70 points can be achieved in the second part of the examination. For this part of the examination, the student write a "Final Exam" in the last week of the lecture period, which takes 2 hours.

Detailed information about the course schedule and the module exam will be announced at the first course date.

A retake opportunity for those who do not pass the module exam will take place at the end of the fourth September calendar week of the same year. The registration for the examination must be made at least 1 day before the beginning of the examination. The following applies to deregistration for the examination: Deregistration can be made online in the student portal up to 1 day before the start of the examination.

Prerequisites

None.

Annotation

Please note that the course is only offered every second summer semester (SS2021, SS2023).

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-101599 - Statistics and Econometrics

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

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 course takes place each second summer term: 2018/2020....

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-101599 - Statistics and Econometrics

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

Events					
WT 20/21	2521302	Financial Econometrics II	2 SWS	Lecture / ▯	Schienle, Buse
WT 20/21	2521303	Übung zu Financial Econometrics II	1 SWS	Practice / ▯	Görgen, Buse, Schienle
Exams					
WT 20/21	7900274	Financial Econometrics II			Schienle

Legend: ▯ Online, ⚙ Blended (On-Site/Online), 🔊 On-Site, ✗ Cancelled

Competence Certificate
Alternative exam assessment (Takehome Exam). Details will be announced at the beginning of the course.

Prerequisites
None

Recommendation
Knowledge of the contents covered by the course "Financial Econometrics"

Annotation
Course language is English
The course takes place each second winter term starting in WS2020/21

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 20/21	2530232	Financial Intermediation	2 SWS	Lecture / 📱	Ruckes
WT 20/21	2530233	Übung zu Finanzintermediation	1 SWS	Practice / 📱	Ruckes, Hoang, Benz
Exams					
WT 20/21	7900063	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 20/21, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

Content
The lecture covers the following topics:

- Arguments for the existence of financial intermediaries
- Bank loan analysis, relationship lending
- Stability of the financial system
- The macroeconomic role of financial intermediation
- Principles of the prudential regulation of banks

Learning outcomes: Students

- are in a position to describe the arguments for the existence of financial intermediaries,
- are able of discuss and analyze both static and dynamic aspects of contractual relationships between banks and borrowers,
- are able to discuss the macroeconomic role of the banking system,
- are in a position to explain the fundamental principles of the prudential regulation of banks and are able to recognize and evaluate the implications of specific regulations.

Workload:

The total workload for this course is approximately 135.0 hours. For further information see the German version.

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 2021	2530216	Financial Management	2 SWS	Lecture / ▤	Ruckes
ST 2021	2530217	Übung zu Financial Management	1 SWS	Practice / ▤	Ruckes, Wiegratz
Exams					
WT 20/21	7900060	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 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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: 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 20/21	24086	Formale Systeme	4 SWS	Lecture / Practice (/ 📱	Beckert, Ulbrich
Exams					
WT 20/21	7500036	Formal Systems			Beckert
ST 2021	7500009	Formal Systems			Beckert

Legend: 📱 Online, ⚬ Blended (On-Site/Online), ● On-Site, ✗ Cancelled

| T | 5.59 Course: Foundations of Interactive Systems [T-WIWI-109816] |

Responsible: Prof. Dr. Alexander Mädche
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101434 - eBusiness and Service Management
M-WIWI-102752 - Fundamentals of Digital Service Systems

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each summer term	2

Events					
ST 2021	2540560	Foundations of Interactive Systems	3 SWS	Lecture / 📱	Mädche
Exams					
WT 20/21	7900326	Foundations of Interactive Systems			Mädche
ST 2021	7900247	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

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

| V | **Foundations of Interactive Systems**
2540560, SS 2021, 3 SWS, Language: English, Open in study portal | Lecture (V)
Online |

Content

Computers have evolved from batch processors towards highly interactive systems. This offers new possibilities but also challenges for the successful design of the interaction between human and computer. Interactive system are socio-technical systems in which users perform tasks by interacting with technology in a specific context in order to achieve specified goals and outcomes.

This lecture introduces key concepts and principles of interactive systems from a human and computer perspective. Furthermore, it describes core development processes for interactive systems as well as provides insights on the use & contexts of interactive systems with a specific focus on selected application areas in organizations and society. With this lecture, students acquire foundational knowledge to successfully design of the interaction between human 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 in order 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-oriented capstone project)

Prerequisites

No specific prerequisites are required for the lecture

Literature

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.

T	**5.60 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	Each summer term	4

Events					
ST 2021	2511226	Grundlagen für mobile Business	2 SWS	Lecture / 🗔	Schiefer, Frister
ST 2021	2511227	Übungen zu Grundlagen für mobile Business	1 SWS	Practice / 🗔	Schiefer, Frister
Exams					
ST 2021	7900001	Foundations of mobile Business (Registration until 12 July 2021)			Oberweis

Legend: 🗔 Online, 🔀 Blended (On-Site/Online), 🎤 On-Site, ✗ Cancelled

Competence Certificate
The assessment of this course is a written (60 min.) or (if necessary) oral examination according to §4(2) of the examination regulation.

Prerequisites
None

Annotation
Lecture and exercises are integrated.

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

V	**Grundlagen für mobile Business** 2511226, SS 2021, 2 SWS, Language: German, Open in study portal	**Lecture (V)** **Online**

Content
The lecture covers the basics of mobile business with a focus on (information) technical basics. These are interlinked with the economic background in Germany.
Contents are:

1. organizational matters
2. introduction & definitions
3. mobile devices
4. mobile radio technologies
5. mobile communications market
6. mobile applications
7. digital radio technologies
8. location & context

Note: The teaching units listed above each have a different scope.

Learning objectives:

If you are confronted with a question in your job which affects "Mobile Business", you should be able to provide answers quickly and competently:

Market structures
technique
Possibilities for applications
lawsuits
issues

Workload:

The total workload for this course unit is approx. 135 hours (4.5 credit points).

Organizational issues
Vorlesung und Übung werden integriert angeboten.

Literature

- Jochen Schiller: Mobilkommunikation (2. Aufl. 2003)
  http://www.mi.fu-berlin.de/inf/groups/ag-tech/teaching/resources/ Mobile_Communications/course_Material/index.html
- Martin Sauter: Grundkurs Mobile Kommunikationssysteme (6. Aufl. 2015)
  http://link.springer.com/book/10.1007%2F978-3-658-08342-7
- Küpper, A.: Location-based Services. Fundamentals and Operation. Wiley & Sons, 2005.
- Roth, J.: Mobile Computing. Grundlagen, Technik, Konzepte. Dpunkt.verlag, 2. Auflage, 2005.
- Mansfeld, W.: Satellitenortung und Navigation:
  Grundlagen, Wirkungsweise und Anwendung globaler Satellitennavigationssysteme
- Dodel, H., Häupler, D.: Satellitennavigation

Einige relevante Informationen im Web

- Bundesnetzagentur http://www.bundesnetzagentur.de
  u.a. Jahresbericht und Marktbeobachtung
- VATM-Marktstudien
  http://www.vatm.de/vatm-marktstudien.html
- Verbände, bspw. BITKOM (bitkom.org), eco e.V. (eco.de)
- Presse, bspw. Teltarif, Heise, Golem, …
- Statistiken (Statista Lizenz des KIT)

T 5.61 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 2021	2581950	Fundamentals of Production Management	2 SWS	Lecture / 📱	Schultmann
ST 2021	2581951	Übungen Grundlagen der Produktionswirtschaft	2 SWS	Practice / 📱	Stallkamp, Steins
Exams					
WT 20/21	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. 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 Fundamentals of Production Management
2581950, SS 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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

Events					
ST 2021	2550134	Globale Optimierung I	2 SWS	Lecture / 📱	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 Globale Optimierung I
2550134, SS 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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 5.63 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 2021	2550134	Globale Optimierung I	2 SWS	Lecture / ▐	Stein
ST 2021	2550135	Übung zu Globale Optimierung I und II	2 SWS	Practice / ▐	Stein, Schwarze, Beck
ST 2021	2550136	Globale Optimierung II	2 SWS	Lecture / ▐	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	**Globale Optimierung I**	Lecture (V)
	2550134, SS 2021, 2 SWS, Language: German, Open in study portal	Online

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	**Globale Optimierung II** 2550136, SS 2021, 2 SWS, Language: German, Open in study portal	**Lecture (V)** **Online**

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 5.64 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 2021	2550136	Globale Optimierung II	2 SWS	Lecture / 📱	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 Globale Optimierung II
2550136, SS 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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	**5.65 Course: Human Resource Management [T-WIWI-102909]**

Responsible: Prof. Dr. Petra Nieken
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101513 - Human Resources and Organizations

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

Events					
WT 20/21	2573005	Human Resource Management	2 SWS	Lecture / ▤	Nieken
WT 20/21	2573006	Übung zu Human Resource Management	1 SWS	Practice / ▤	Nieken, Mitarbeiter
Exams					
WT 20/21	7900200	Human Resource Management			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	**Human Resource Management** 2573005, WS 20/21, 2 SWS, Language: German, Open in study portal	**Lecture (V)** **Online**

Content
The students acquire basic knowledge in the fields of human resource planning, selection and talent management. Different processes and instruments and their link to corporate strategy are evaluated based on microeconomic and behavioral approaches. The results are tested and discussed based on empirical data.

Aim

The student

- understands the processes and instruments of human resource management.
- analyzes different methods of human resource planning and selection and evaluates their usefulness.
- analyzes different processes of talent management and evaluates the strengths and weaknesses.
- understands the challenges of human resource management and its link to corporate strategy.

Workload

The total workload for this course is approximately 135 hours.

Lecture: 32 hours

Preparation of lecture: 52 hours

Exam preparation: 51 hours

Literature

- Personnel Economics in Practice, Lazear & Gibbs, John Wiley & Sons, 2014
- Strategic Human Resources. Frameworks for General Managers, Baron & Kreps, John Wiley & Sons, 1999

T 5.66 Course: Human-Machine-Interaction [T-INFO-101266]

Responsible: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: M-INFO-100729 - Human Computer Interaction

Type	Credits	Grading scale	Recurrence	Version
Written examination	6	Grade to a third	Each summer term	2

Events					
ST 2021	24659	Human-Computer-Interaction	2 SWS	Lecture / 📱	Beigl
Exams					
WT 20/21	7500076	Human-Machine-Interaction			Beigl
ST 2021	7500048	Human-Machine-Interaction			Beigl

Legend: 📱 Online, 🔀 Blended (On-Site/Online), 🎙 On-Site, ✗ Cancelled

T   5.67 Course: Human-Machine-Interaction Pass [T-INFO-106257]

Responsible: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: M-INFO-100729 - Human Computer Interaction

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each summer term	1

Events					
ST 2021	2400095	Human-Computer-Interaction	1 SWS	Practice / 🖥	Beigl
ST 2021	24659	Human-Computer-Interaction	2 SWS	Lecture / 🖥	Beigl
Exams					
ST 2021	7500121	Human-Machine-Interaction			Beigl

Legend: 🖥 Online, ♻ Blended (On-Site/Online), 🔊 On-Site, ✗ Cancelled

T   5.68 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 20/21	7900296	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 5.69 Course: Integrated Network and Systems Management [T-INFO-101284]

Responsible: Prof. Dr. Bernhard Neumair
Organisation: KIT Department of Informatics
Part of: M-WIWI-101440 - Information Services in Networks

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

Events					
ST 2021	2400004	Integrated Network and Systems Management	2 SWS	Lecture / 📱	Neumair

Legend: 📱 Online, ⚗ Blended (On-Site/Online), 🎤 On-Site, ✗ Cancelled

T   5.70 Course: Intellectual Property and Data Protection [T-INFO-109840]

Responsible:	Prof. Dr. Thomas Dreier
	Dr. Johannes Eichenhofer
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 20/21	24018	Datenschutzrecht	2 SWS	Lecture / 🖥	Eichenhofer
WT 20/21	24070	Industrial Property and Copyright Law	2 SWS	Lecture / 🖥	Dreier
Exams					
WT 20/21	7500184	Intellectual Property and Data Protection			Dreier, Eichenhofer, Matz

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 👤 On-Site, ✗ Cancelled

| T | **5.71 Course: International Finance [T-WIWI-102646]** |

Responsible: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101402 - eFinance
M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I

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

Events					
WT 20/21	2530570	International Finance	2 SWS	Lecture / 🗣	Walter, Uhrig-Homburg
ST 2021	2530570	International Finance	2 SWS	Lecture / 📱	Walter, Uhrig-Homburg
Exams					
WT 20/21	7900052	International Finance			Uhrig-Homburg

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

Competence Certificate
Depending on further pandemic developments, the examination will be offered in the summer semester 2021 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
None

Annotation
The course will not be offered in the summer semester 2020 as originally planned, but only in the winter semester 2020/2021.

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, WS 20/21, 2 SWS, Language: German, Open in study portal | **Lecture (V)**
On-Site |

Organizational issues
Blockveranstaltung

Literature
Weiterführende Literatur:

- Eiteman, D. et al., Multinational Business Finance, 13. Auflage, 2012.
- Solnik, B. und D. McLeavey, Global Investments, 6. Auflage, 2008.

| V | **International Finance**
2530570, SS 2021, 2 SWS, Language: German, Open in study portal | **Lecture (V)**
Online |

Organizational issues
nach dem 21.04. 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 5.72 Course: Internship [T-WIWI-103093]

Responsible: Studiendekan der KIT-Fakultät für Informatik
Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101433 - Internship

Type	Credits	Grading scale	Version
Completed coursework	8	pass/fail	1

Competence Certificate
see module description

Prerequisites
see module description

Annotation
see module description

T 5.73 Course: Introduction in Computer Networks [T-INFO-102015]

Responsible:	Prof. Dr. Martina Zitterbart
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101178 - Communication and Database Systems
	M-INFO-101194 - Telematics

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

Events					
ST 2021	24519	Einführung in Rechnernetze	2 SWS	Lecture / 🖥	Kopmann, Neumeister, Schneider, Friebe, Jung, Zitterbart
ST 2021	24521	Übung zu Einführung in Rechnernetze	1 SWS	Practice / 🖥	Kopmann, Neumeister, Schneider, Friebe, Jung, Zitterbart
Exams					
WT 20/21	7500201	Introduction to Computer Networking			Zitterbart
ST 2021	7500116	Introduction to Computer Networking			Zitterbart

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🔊 On-Site, ✗ Cancelled

T 5.74 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	4

Events					
ST 2021	2581010	Introduction to Energy Economics	2 SWS	Lecture / 🖥	Fichtner
ST 2021	2581011	Übungen zu Einführung in die Energiewirtschaft	2 SWS	Practice / 🖥	Lehmann, Sandmeier, Ardone, Fichtner
Exams					
WT 20/21	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 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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 5.75 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	2

Events					
ST 2021	2520525	Introduction to Game Theory	2 SWS	Lecture / 📱	Reiß
ST 2021	2520526	Übungen zu Einführung in die Spieltheorie	1 SWS	Practice / 📱	Peters, Reiß
Exams					
WT 20/21	7900346	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 resited at every ordinary examination date.

Recommendation

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 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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. A short introduction to cooperative game theory is given if there is sufficient time.

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.

The module [M-WIWI-101398] *Introduction to Economics* must have been passed.

Recommendations:

Basic knowledge of mathematics and statistics is assumed.

The total workload for this course is approximately 135.0 hours. For further information see German version.

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   5.76 Course: Introduction to Information Engineering and Management [T-WIWI-102757]

Responsible:	Prof. Dr. Andreas Geyer-Schulz
	Prof. Dr. Christof Weinhardt
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101491 - Foundations in Business Administration

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

Competence Certificate
Oral examination

Prerequisites
None

| T | **5.77 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 Written examination	**Credits** 9	**Grading scale** Grade to a third	**Recurrence** see Annotations	**Version** 1

Events					
WT 20/21	2530043	Introduction to Operations Research II	2 SWS	Lecture / 🖥	Rebennack
WT 20/21	2530044			Tutorial (/ 🖥	Rebennack, Sinske
ST 2021	2550040	Introduction to Operations Research I	2 SWS	Lecture / 🖥	Nickel
Exams					
WT 20/21	7900290	Introduction to Operations Research I and II			Rebennack
ST 2021	7900237	Introduction to Operations Research I and II			Rebennack

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 July), one examination is held for both courses.

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

Prerequisites

None

Recommendation

Mathematics I und II. Programming knowledge for computing exercises.

It is strongly recommended to attend the course *Introduction to Operations Research I* [2550040] before attending the course *Introduction to Operations Research II* [2530043].

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

| V | **Introduction to Operations Research II**
2530043, WS 20/21, 2 SWS, Language: German, Open in study portal | **Lecture (V)**
Online |

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 2021, 2 SWS, Language: German, Open in study portal | **Lecture (V)**
Online |

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, 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

T 5.78 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 20/21	2560131	Introduction to Public Finance	3 SWS	Lecture / ▯	Wigger
Exams					
WT 20/21	790fiwi	Introduction to Public Finance			Wigger

Legend: ▯ Online, ✿ Blended (On-Site/Online), ◕ On-Site, ✗ Cancelled

Competence Certificate

Depending on the further pandemic development in the summer semester 2021 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 20/21, 3 SWS, Language: German, Open in study portal

Lecture (V)
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.

Organizational issues
Donnerstag 14:00-15:30 Uhr per Zoom-Livestream

Literature
Literatur:

Wigger, B. U. 2006. *Grundzüge der Finanzwissenschaft*. Springer: Berlin.

T 5.79 Course: Introduction to Stochastic Optimization [T-WIWI-106546]

Responsible:	Prof. Dr. Steffen Rebennack
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-103337 - Optimization under Uncertainty

Type	Credits	Grading scale	Recurrence	Version
Examination of another type	4,5	Grade to a third	Each summer term	2

Events					
ST 2021	2550470	Einführung in die Stochastische Optimierung	2 SWS	Lecture / 🖥	Rebennack
ST 2021	2550471	Übung zur Einführung in die Stochastische Optimierung	1 SWS	Practice / 🖥	Rebennack, Sinske
ST 2021	2550474	Rechnerübung zur Einführung in die Stochastische Optimierung	2 SWS	Practice / 🖥	Rebennack, Sinske
Exams					
WT 20/21	7900242	Introduction to Stochastic Optimization			Rebennack

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🎤 On-Site, ✗ Cancelled

Competence Certificate
Alternative exam assessment (open book exam). The exam takes place in every semester.

Prerequisites
None.

T 5.80 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 2021	2530575	Investments	2 SWS	Lecture / 📱	Uhrig-Homburg
ST 2021	2530576	Übung zu Investments	1 SWS	Practice / 📱	Uhrig-Homburg, Eberbach
Exams					
WT 20/21	7900054	Investments			Uhrig-Homburg

Legend: 📱 Online, ⚄ Blended (On-Site/Online), ◕ On-Site, ✗ Cancelled

Competence Certificate
Depending on further pandemic developments, the examination will be offered in the summer semester 2021 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
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)
	2530575, SS 2021, 2 SWS, Language: German, Open in study portal	Online

Organizational issues
Veranstaltungskonzept umfasst vollständige Aufzeichnungen von Vorlesung und Übung. Ergänzend bieten wir zweiwöchig freiwillige Live-Fragerunden zum fachlichen und organisatorischen Austausch an.

Literature
Weiterführende Literatur:

Bodie/Kane/Marcus (2010): Essentials of Investments, 8. Aufl., McGraw-Hill Irwin, Boston

T   **5.81 Course: IT-Security Management for Networked Systems [T-INFO-101323]**

Responsible: Prof. Dr. Hannes Hartenstein
Organisation: KIT Department of Informatics
Part of: M-INFO-100786 - IT-Security Management for Networked Systems

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

T	5.82 Course: Lab: Working with Database Systems [T-INFO-103552]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-101193 - Foundations of Information Systems
                    M-INFO-101229 - Database Systems in Theory and Practice
                    M-INFO-101235 - Introduction to Data and Information Management

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	4	pass/fail	Each winter term	2

Events					
WT 20/21	24317	Arbeiten mit Datenbanksystemen	2 SWS	Practical course / 🗣	Böhm
Exams					
WT 20/21	7500146	Lab: Working with Database Systems			Böhm

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

T   5.83 Course: Logistics and Supply Chain Management [T-WIWI-102870]

Responsible:	Prof. Dr. Frank Schultmann
	Dr. Marcus Wiens
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	1

Events					
ST 2021	2581996	Logistics and Supply Chain Management	2 SWS	Lecture / 🖥	Wiens, Schultmann
ST 2021	2581997	Übung zu Logistics and Supply Chain Management	1 SWS	Practice / 🖥	Diehlmann, Lüttenberg

Exams				
WT 20/21	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. 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   Logistics and Supply Chain Management
2581996, SS 2021, 2 SWS, Language: English, Open in study portal

Lecture (V)
Online

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   5.84 Course: Macroeconomic Theory [T-WIWI-109121]

Responsible:	Prof. Dr. Johannes Brumm
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101501 - Economic Theory
	M-WIWI-101668 - Economic Policy I

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

Events					
WT 20/21	2560404	Macroeconomic Theory	2 SWS	Lecture / 📱	Scheffel
WT 20/21	2560405	Übung zu Macroeconomic Theory	1 SWS	Practice / 📱	Pegorari
Exams					
WT 20/21	7900264	Macroeconomic Theory			Scheffel

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.

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

V	**Macroeconomic Theory**	**Lecture (V)**
	2560404, WS 20/21, 2 SWS, Language: English, Open in study portal	**Online**

Literature
Literatur und Skripte werden in der Veranstaltung angegeben.

## T 5.85 Course: Management and Strategy [T-WIWI-102629]

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 2021	2577900	Management and Strategy	2 SWS	Lecture / ▯	Lindstädt
Exams					
WT 20/21	7900199	Management and Strategy			Lindstädt
ST 2021	7900067	Management and Strategy			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	**Management and Strategy**	**Lecture (V)**
	2577900, SS 2021, 2 SWS, Language: German, Open in study portal	**Online**

Content

The participants learn about central concepts of strategic management along the ideal-typical strategy process: internal and external strategic analysis, concept and sources of competitive advantages, their importance when establishing competitive and corporate strategies as well as strategy assessment and implementation. This aims in particular to provide a summary of the basic concepts and models of strategic management, i.e. to provide in particular an action-oriented integration. Thereby a focus is on imparting knowledge about how price developments in oligopolistic markets can be understood, modeled and forecasted based on game theory.

Content in brief:

- Corporate management principles
- Strategic management principles
- Strategic analysis
- Competitive strategy: modelling and selection on a divisional level
- Strategies for oligopolies and networks: anticipation of dependencies
- Corporate strategy: modelling and evaluation on a corporate level
- Strategy implementation

Learning Objectives:

After passing this course students are able to

- prepare strategic decisions along the ideal-typical strategy process in practice ("strategic analysis").
- assess strategic options.
- explain the portfolio management (Parental advantage and best owner of business entities).
- discuss price and capacity decisions in oligopolies and explain them in examples.

Recommendations:

None.

Workload:

The total workload for this course is approximately 105.0 hours. For further information see German version.

Assessment:

Depending on further pandemic developments, the examination will be offered in the summer semester 2021 either as an open-book examination (examination performance of a different kind according to SPO § 4 para. 2, item 3), or as a 60-minute written examination (written examination according to SPO § 4 para. 2, item 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.: *Strategisches Management*. Pearson Studium, 5., aktualisierte Aufl., München 2006.

Die relevanten Auszüge und zusätzliche Quellen werden in der Veranstaltung bekannt gegeben.

T 5.86 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
	M-WIWI-101513 - Human Resources and Organizations

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

Events					
WT 20/21	2577902	Managing Organizations	2 SWS	Lecture / 📱	Lindstädt
Exams					
WT 20/21	7900049	Managing Organizations			Lindstädt
ST 2021	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**	Lecture (V)
	2577902, WS 20/21, 2 SWS, Language: German, Open in study portal	**Online**

Content

The course should enable the participants to assess the strengths and weaknesses of existing organisational structures and rules using systematic criteria. Here concepts and models for designing organisation structures, regulating organizational processes and managing organisational changes are presented and discussed using case studies. The course is structured to relate to actions and aims to give students a realistic view of the opportunities and limits of rational design approaches.

Content in brief:

- Principles of organisational management
- Managing organisational structures and processes: the selection of design parameters
- Ideal-typical organisational structures: choice and effect of parameter combinations
- Managing organisational changes

Learning Objectives:

After passing this course students are able to

- evaluate strengths and weaknesses of existing organisational structures and rules.
- compare alternatives of organisational structure in practice and assess and interpret them regarding their effectiveness and efficiency.
- assess the management of organisational changes.

Recommendations:

None.

Workload:

The total workload for this course is approximately 105.0 hours. For further information see German version.

Assessment:

Depending on further pandemic developments, the examination will be offered in the summer semester 2021 either as an open-book examination (examination performance of a different kind according to SPO § 4 para. 2, item 3), or as a 60-minute written examination (written examination according to SPO § 4 para. 2, item 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.

A bonus can be acquired through successful participation in the exercises. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for the award of 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 5.87 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 Examination of another type	Credits 4,5	Grading scale Grade to a third	Recurrence Each summer term	Version 2

Events					
ST 2021	2571152	Managing the Marketing Mix	2 SWS	Lecture / ▤	Klarmann
ST 2021	2571153	Übung zu Marketing Mix (Bachelor)	1 SWS	Practice / ▤	Pade
Exams					
ST 2021	7900023	Managing the Marketing Mix			Klarmann

Legend: ▤ Online, ⚉ Blended (On-Site/Online), ◕ On-Site, ✗ Cancelled

Competence Certificate
The assessment is carried out (according to §4(2), 3 of the examination regulation) through the preparation and presentation of a case study (max. 30 points) and a written open book exam (max. 60 points). In total, a maximum of 90 points can be earned during the course. In the summer term 2021, the written open book exam will either take place in the lecture hall or online, depending on further pandemic developments.
Further details on the case study and open book exam will be announced in 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).

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

V **Managing the Marketing Mix** 2571152, SS 2021, 2 SWS, Language: German, Open in study portal	**Lecture (V) Online**

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 5.88 Course: Mathematics I for Information Engineering and Management - Exam [T-MATH-102266]

Responsible: Prof. Dr. Andreas Rieder
Dr. Daniel Weiß
Prof. Dr. Christian Wieners

Organisation: KIT Department of Mathematics

Part of: M-MATH-101311 - Mathematics I

Type	Credits	Grading scale	Version
Written examination	7	Grade to a third	1

Events					
WT 20/21	0136000	Mathematik 1 für die Fachrichtung Wirtschaftsinformatik	4 SWS	Lecture / ⚙	Weiß
Exams					
WT 20/21	6700033	Mathematics I for Information Engineering and Management - Exam			Weiß

Legend: ▯ Online, ⚙ Blended (On-Site/Online), ● On-Site, ✗ Cancelled

T 5.89 Course: Mathematics I for Information Engineering and Management - Exercise [T-MATH-102267]

Responsible:	Prof. Dr. Andreas Rieder
	Dr. Daniel Weiß
	Prof. Dr. Christian Wieners
Organisation:	KIT Department of Mathematics
Part of:	M-MATH-101311 - Mathematics I

Type	**Credits**	**Grading scale**	**Version**
Written examination	1	Grade to a third	1

Events					
WT 20/21	0136100	Übungen zu 0136000	2 SWS	Practice / ⚙	Weiß
Exams					
WT 20/21	6700010	Mathematics I for Information Engineering and Management - Exercise			Weiß

Legend: 🗔 Online, ⚙ Blended (On-Site/Online), 🌣 On-Site, ✗ Cancelled

T 5.90 Course: Mathematics II for Information Engineering and Management - Exam [T-MATH-102269]

Responsible:	Prof. Dr. Andreas Rieder
	Dr. Daniel Weiß
	Prof. Dr. Christian Wieners
Organisation:	KIT Department of Mathematics
Part of:	M-MATH-101312 - Mathematics II

Type	Credits	Grading scale	Version
Written examination	7	Grade to a third	1

Events					
ST 2021	0187700	Mathematik II für Wirtschaftsinformatik	4 SWS	Lecture / 📱	Weiß
Exams					
WT 20/21	7700069	Mathematics II for Information Engineering and Management - Exam			Rieder

Legend: 📱 Online, ⚙ Blended (On-Site/Online), 🎤 On-Site, ✘ Cancelled

T   5.91 Course: Mathematics II for Information Engineering and Management - Exercise [T-MATH-102268]

Responsible:	Prof. Dr. Andreas Rieder
	Dr. Daniel Weiß
	Prof. Dr. Christian Wieners
Organisation:	KIT Department of Mathematics
Part of:	M-MATH-101312 - Mathematics II

Type	Credits	Grading scale	Version
Written examination	1	Grade to a third	1

Events					
ST 2021	0187800	Übungen zu 0187700	2 SWS	Practice / 📱	Weiß

Legend: 📱 Online, ⚜ Blended (On-Site/Online), ✪ On-Site, ✗ Cancelled

T   5.92 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 20/21	2400077	Mechano-Informatics and Robotics	2 SWS	Lecture / 📱	Asfour
Exams					
WT 20/21	7500176	Mechano-Informatics and Robotics			Asfour
ST 2021	7500217	Nachprüfung: Mechano-Informatics and Robotics			Asfour

Legend: 📱 Online, 💠 Blended (On-Site/Online), 🔘 On-Site, ✗ Cancelled

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

V   Mechano-Informatics and Robotics
2400077, WS 20/21, 2 SWS, Language: German/English, Open in study portal

Lecture (V)
Online

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.

Recommendations:
Participating in the „Basispraktikums Mobile Roboter" is recommended.

Workload:
Lecture with 2 SWS, 4 LP.

4 LP correspond to ca. 120 hours, thereof

ca. 40 hrs. presence during lectures,

ca. 30 hrs. preparation and rework time,

ca. 50 hrs. preparation for exam.

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   5.93 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
Oral examination	5	Grade to a third	Each winter term	1

Events					
WT 20/21	2400051	Mobile Computing and Internet of Things	2+1 SWS	Lecture / Practice (/ 📱	Beigl
Exams					
WT 20/21	7500277_0125	Mobile Computing and Internet of Things			Beigl
WT 20/21	7500277_0129	Mobile Computing and Internet of Things			Beigl
WT 20/21	7500277_0216	Mobile Computing and Internet of Things			Beigl
WT 20/21	7500277_0226	Mobile Computing and Internet of Things			Beigl
WT 20/21	7500277_0308	Mobile Computing and Internet of Things			Beigl
WT 20/21	7500277_0401	Mobile Computing and Internet of Things			Beigl
WT 20/21	7500277_0503	Mobile Computing and Internet of Things			Beigl
WT 20/21	7500277_0506	Mobile Computing and Internet of Things			Beigl
WT 20/21	7500277_1222	Mobile Computing and Internet of Things			Beigl
ST 2021	7500107	Mobile Computing and Internet of Things			Beigl

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

T   5.94 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 Completed coursework	Credits 4	Grading scale pass/fail	Recurrence Each summer term	Version 2

Events					
ST 2021	24624	Mobile Robots - Practical Course	4 SWS	Practical course / 🖥	Asfour
Exams					
ST 2021	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 2021, 4 SWS, Language: German, Open in study portal

Practical course (P)
Online

Content
In this practical course, students assemble an ASURO robot in groups of two. Each student will be provided with his own robot, which he has 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:

The student is able to understand circuit diagrams and can assemble, test and debug complex PCBs. The student is 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

Modul für Bachelor Maschinenbau, Mechatronik und Informationstechnik, Elektrotechnik und Informationstechnik

T 5.95 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 Examination of another type	Credits 4,5	Grading scale Grade to a third	Recurrence Each summer term	Version 2

Events					
ST 2021	2550490	Modellieren und OR-Software: Einführung	3 SWS	Practical course / 🖥	Nickel, Pomes, Bakker, Zander
Exams					
WT 20/21	00040	Modeling and OR-Software: Introduction			Nickel
ST 2021	7900153	Modeling and OR-Software: Introduction			Nickel

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🔊 On-Site, ✗ Cancelled

Competence Certificate

The assessment is a 120 minutes examination, including a written and a practical part (according to §4(2), 1 of the examination regulation).

The examination is held in the term of the software laboratory and the following term.

Prerequisites

None

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 2021, 3 SWS, Language: German, Open in study portal

Practical course (P)
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.

T 5.96 Course: Nonlinear Optimization I [T-WIWI-102724]

Responsible:	Prof. Dr. Oliver Stein
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101936 - Methodical Foundations of OR
	M-WIWI-103337 - Optimization under Uncertainty

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

Events					
WT 20/21	2550111	Nonlinear Optimization I	2 SWS	Lecture / 🖥	Stein
WT 20/21	2550112	Exercises Nonlinear Optimization I + II		Practice / 🖥	Stein
Exams					
WT 20/21	7900086_WS2021_HK	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 20/21, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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, SpringerSpektrum, 2018

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 | 5.97 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 20/21	2550111	Nonlinear Optimization I	2 SWS	Lecture / 🖥	Stein
WT 20/21	2550112	Exercises Nonlinear Optimization I + II		Practice / 🖥	Stein
WT 20/21	2550113	Nonlinear Optimization II	2 SWS	Lecture / 🖥	Stein
Exams					
WT 20/21	7900088_WS2021_HK	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 20/21, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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, SpringerSpektrum, 2018

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 20/21, 2 SWS, Language: German, Open in study portal	**Lecture (V)** **Online**

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, SpringerSpektrum, 2018

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 5.98 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 20/21	2550112	Exercises Nonlinear Optimization I + II		Practice / 🖥	Stein
WT 20/21	2550113	Nonlinear Optimization II	2 SWS	Lecture / 🖥	Stein
Exams					
WT 20/21	7900087_WS2021_HK	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 20/21, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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, SpringerSpektrum, 2018

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   5.99 Course: Optimization under Uncertainty [T-WIWI-106545]

Responsible:	Prof. Dr. Steffen Rebennack
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 winter term	3

Events					
WT 20/21	2550464	Optimierungsansätze unter Unsicherheit		Lecture / 📱	Rebennack
WT 20/21	2550465	Übungen zu Optimierungsansätze unter Unsicherheit		Practice / 📱	Rebennack, Füllner
WT 20/21	2550466		2 SWS	Practice / 📱	Rebennack, Füllner
Exams					
WT 20/21	7900240	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.

T 5.100 Course: Personnel Policies and Labor Market Institutions [T-WIWI-102908]

Responsible:	Prof. Dr. Petra Nieken
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101513 - Human Resources and Organizations
	M-WIWI-101668 - Economic Policy I

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

Events					
ST 2021	2573001	Personnel Policies and Labor Market Institutions	2 SWS	Lecture / 📱	Nieken
ST 2021	2573002	Übungen zu Personalpolitik und Arbeitsmarktinstitutionen	1 SWS	Practice / 📱	Nieken, Mitarbeiter
Exams					
WT 20/21	7900202	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	**Personnel Policies and Labor Market Institutions**	Lecture (V)
	2573001, SS 2021, 2 SWS, Language: German, Open in study portal	**Online**

Content

The students acquire knowledge about the process and the strategic aspects of collective bargaining about wages. They analyze selected aspects of corporate governance and co-determination in Germany. The lecture also addresses questions of personnel politics and labor market discrimination. Microeconomic and behavioral approaches as well as empirical data is used and evaluated critically.

Aim

The student

- understands the process and role of agents in collective wage bargaining.
- analyzes strategic decisions in the context of corporate governance.
- understands the concept of co-determination in Germany.
- challenges statements that evaluate certain personnel politics.

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

Organizational issues

Die Vorlesungsinhalte sind als Aufzeichnungen verfügbar. An ausgewählten Vorlesungsterminen gibt es Live-Sessions. Diese werden zum Vorlesungsstart bekannt gegeben.
There are recordings of the lecture contents. There will be live sessions on selected lecture dates. These will be announced at the start of the lecture time.

T 5.101 Course: Platform Economy [T-WIWI-109936]

Responsible:	Dr. Verena Dorner
	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

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

Events					
WT 20/21	2540468	Platform Economy	2 SWS	Lecture / ⚙	Dann, Weinhardt
WT 20/21	2540469	Übung zu Platform Economy		Practice / 🎙	Dann, Richter
Exams					
WT 20/21	7900213	Platform Economy			Weinhardt

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. Details of the grades will be announced at the beginning of the course.

Prerequisites
see below

Recommendation
None

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

V	**Platform Economy**	Lecture (V)
	2540468, WS 20/21, 2 SWS, Language: German, Open in study portal	Blended (On-Site/Online)

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)
- Chuen, D.L.K., ed. 2015. "Handbook of digital currency: Bitcoin, innovation, financial instruments, and big data," Academic Press.
- 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	**5.102 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 Completed coursework	**Credits** 4	**Grading scale** pass/fail	**Recurrence** Each winter term	**Version** 1

Events					
WT 20/21	24306	Lego Mindstorms - Laboratory	3 SWS	Practical course / 🧩	Asfour
Exams					
WT 20/21	7500179	Lego Mindstorms - Practical Course			Asfour

Legend: 📱 Online, 🧩 Blended (On-Site/Online), 🌐 On-Site, ✗ Cancelled

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

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

V	**Lego Mindstorms - Laboratory** 24306, WS 20/21, 3 SWS, Language: German, Open in study portal	**Practical course (P)** **Blended (On-Site/Online)**

Content
In this practical course, teams of three students build and program a mobile robot using Lego Mindstorms and the Java 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 Java 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: Pascal Weiner

E-Mail: pascal.weiner@kit.edu

Empfehlung:

Grundlegende Kenntnisse in Java sind hilfreich, aber nicht zwingend erforderlich. / Basic knowledge in JAVA 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 JAVA 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 5.103 Course: Practical Seminar: Digital Services [T-WIWI-110888]

Responsible:	Prof. Dr. Gerhard Satzger
	Prof. Dr. Christof Weinhardt
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-102752 - Fundamentals of Digital Service Systems

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

Events					
WT 20/21	2540555	Practical Seminar: Digital Services (Ba)	3 SWS	Lecture	Mädche
Exams					
WT 20/21	7900363	Practical Seminar: Information Systems and Service Design			Mädche

Competence Certificate

The assessment consists of a seminar paper, a presentation of the results and the contribution to the discussion (according

to §4(2), 3 of the examination regulation). The final grade is based on the evaluation of each component (seminar paper, oral presentation, and active participation).

Prerequisites

None

Recommendation

None

Annotation

The current range of seminar topics is announced on the KSRI website www.ksri.kit.edu.

T 5.104 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
	M-WIWI-101513 - Human Resources and Organizations

Type Written examination	Credits 2	Grading scale Grade to a third	Recurrence Each summer term	Version 1

Events					
ST 2021	2577910	Problem solving, communication and leadership	1 SWS	Lecture / 🖥	Lindstädt
Exams					
WT 20/21	7900070	Problem Solving, Communication and Leadership			Lindstädt
ST 2021	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** 2577910, SS 2021, 1 SWS, Language: German, Open in study portal	Lecture (V) **Online**

Content

The course deals with various aspects of problem solving and communication processes and is divided into two parts. The first part of the course addresses the fundamental steps in the problem-solving process; namely, problem identification, problem structuring, problem analysis and communication of solution. Ideas for structuring problem solving processes will be discussed and the perquisites for and principles of structured communication based on charts and presentations will be explained. The second part of the course addresses important concepts in leadership, including the context-specificity of influence, the choice of leader and the characteristics of employees. The course content reflects current issues in management and communication practice and is oriented toward the practical application of theoretical insights to these issues. In this respect, the course aims to develop interdisciplinary skills.

Learning Objectives:

After passing this course students are able to

- structure problem solving processes.
- apply the principles of focused communication based on charts and presentations.
- understand leadership in the context of situation and personality.

Recommendations:

None.

Workload:

The total workload for this course is approximately 60 hours. For further information see German version.

Assessment:

Depending on further pandemic developments, the examination will be offered in the summer semester 2021 either as an open-book examination (examination performance of a different kind according to SPO § 4 para. 2, item 3), or as a 60-minute written examination (written examination according to SPO § 4 para. 2, item 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 5.105 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 2021	2511204	Process Mining	2 SWS	Lecture / 🖥	Oberweis
ST 2021	2511205	Exercise Process Mining	1 SWS	Practice / 🖥	Oberweis, Schreiber
Exams					
WT 20/21	7900033	Process Mining (Registration until 08 February 2021)			Oberweis
ST 2021	7900048	Process Mining (Registration until 12 July 2021)			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** 2511204, SS 2021, 2 SWS, Language: German, Open in study portal	**Lecture (V)** **Online**

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 5.106 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 20/21	2581960	Production Economics and Sustainability	2 SWS	Lecture / 📱	Volk, Schultmann

Exams				
WT 20/21	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. 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).

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

V	**Production Economics and Sustainability**	**Lecture (V)**
	2581960, WS 20/21, 2 SWS, Language: German, Open in study portal	**Online**

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

Literature

wird in der Veranstaltung bekannt gegeben

| T | **5.107 Course: Programming [T-INFO-101531]** |

Responsible: Prof. Dr.-Ing. Anne Koziolek
Prof. Dr. Ralf Reussner
Organisation: KIT Department of Informatics
Part of: M-INFO-101174 - Programming
M-WIWI-101528 - Orientation Exam

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

Events					
WT 20/21	24004	Programming	4 SWS	Lecture / Practice (/ 📱	Koziolek
Exams					
WT 20/21	7500075	Programming			Koziolek
ST 2021	7500195	Programming			Reussner

Legend: 📱 Online, ⚙ Blended (On-Site/Online), 👤 On-Site, ✗ Cancelled

T 5.108 Course: Programming Pass [T-INFO-101967]

Responsible:	Prof. Dr.-Ing. Anne Koziolek
	Prof. Dr. Ralf Reussner
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101174 - Programming
	M-WIWI-101528 - Orientation Exam

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	0	pass/fail	Each term	1

Events					
WT 20/21	24004	Programming	4 SWS	Lecture / Practice (/ 📱	Koziolek

Exams				
WT 20/21	7500074	Programming Pass		Koziolek
ST 2021	7500022	Programming Pass		Reussner

Legend: 📱 Online, ⚉ Blended (On-Site/Online), 🎤 On-Site, ✗ Cancelled

T 5.109 Course: Project Management in Practice [T-INFO-101976]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-101193 - Foundations of Information Systems
M-INFO-101235 - Introduction to Data and Information Management

Type Completed coursework	Credits 1,5	Grading scale pass/fail	Recurrence Irregular	Version 1

Events					
ST 2021	2400019	Project Management in Practice	2 SWS	Lecture / 📱	Böhm, Schnober

Legend: 📱 Online, ⚜ Blended (On-Site/Online), ✊ On-Site, ✗ Cancelled

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

V Project Management in Practice
2400019, SS 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

Content

At the end of the course, the participants:

- Know the principles of project management and are able to make use of them in real-world case studies.
- Have profound knowledge about project phases, principles of project planning, fundamental elements such as project charter & scope definitions, descriptions of project goals, acitvity planning, milestones, project-structure plans, agenda and cost planning and risk management. Further, they know principle elements of project implementation, crisis management, escalation and, last but not least , project-termination activities.
- Understand and are able to adopt the fundamentals of planning as well as the subjective factors which are relevant in a project. This includes topics such as communication, group processes, teambuilding, leadership, creative solution methods and risk-assessment methods.

The following key skills are taught:

- Project planning
- Project control
- Communication
- Leadership behavior
- Crisis management
- Identification of and solutions of difficult situations
- Team building
- Motivation (of oneself and of others)

Organizational issues
Die Plätze sind begrenzt und die Anmeldung findet durch das Sekretariat Prof. Böhm statt.
Termine

FR, 16. 4. von 13:00 bis18:00 Uhr

SA, 17.4. von 9:00 bis 15:30 Uhr

FR, 23.4. von 13:00 bis 18:00 Uhr

SA, 24.4. von 9:00 bis 15:30 Uhr

T 5.110 Course: Public Law I & II [T-INFO-110300]

Responsible:	Dr. Johannes Eichenhofer
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101192 - Constitutional and Administrative Law

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

Events					
WT 20/21	24016	Öffentliches Recht I - Grundlagen	2 SWS	Lecture / 📱	Eichenhofer
ST 2021	24520	Öffentliches Recht II - Öffentliches Wirtschaftsrecht	2 SWS	Lecture / 📱	Eichenhofer
Exams					
WT 20/21	7500138	Public Law I & II			Eichenhofer
ST 2021	7500298	Public Law I & II			Eichenhofer

Legend: 📱 Online, ⚙ Blended (On-Site/Online), 🎙 On-Site, ✗ Cancelled

T 5.111 Course: Public Revenues [T-WIWI-102739]

Responsible:	Prof. Dr. Berthold Wigger
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101403 - Public Finance
	M-WIWI-101499 - Applied Microeconomics
	M-WIWI-101668 - Economic Policy I

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

Events					
ST 2021	2560120	Public Revenues	2 SWS	Lecture / 🖥	Wigger
ST 2021	2560121	Übung zu Öffentliche Einnahmen	1 SWS	Practice / 🖥	Wigger
Exams					
WT 20/21	790oeff	Public Revenues			Wigger

Legend: 🖥 Online, 🏵 Blended (On-Site/Online), ♟ On-Site, ✗ Cancelled

Competence Certificate

Depending on the further pandemic development in the summer semester 2021 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 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

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 5.112 Course: Public Sector Finance [T-WIWI-109590]

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	2

Events					
WT 20/21	2560136		3 SWS	Lecture / 🎤	Wigger, Groh
Exams					
WT 20/21	790oefi	Public Sector Finance			Wigger

Legend: 📱 Online, ⚄ Blended (On-Site/Online), 🎤 On-Site, ✗ Cancelled

Competence Certificate

Depending on the further pandemic development in the summer semester 2021 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

T-WIWI-107763 "Municipal Finance" must not be selected.

Annotation

Previous title until winter semester 2018/19 "Municipal Finance".

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

V 2560136, WS 20/21, 3 SWS, Language: German, Open in study portal

Lecture (V)
On-Site

Content

The course *Municipal Finance* addresses the theory and policy of municipal revenues and spending including grants, municipal revenue equalisation, taxation as well as municipal and public enterprises.

At the beginning of the course, fundamental concepts of taxation theory as well as key elements of the German taxation system are introduced. The allocative and distributive effects of different taxation methods are examined thereafter and are combined within the theory of optimal taxation. The following chapter is concerned with municipal borrowing and illustrates ways to acquire additional funding. After addressing the extent, structure and variety of municipal borrowing, macroeconomic theories are introduced and applied to the municipal sector. In the course of this final chapter, special attention will be paid to the long term consequences and the sustainability of municipal borrowing as a means of budgeting.

Learning goals:

The students:

- are familiar with the theory and policy of municipal revenues and spending.
- are able to evaluate the allocative and distributive effects of different kinds of municipal revenues and spending.
- understand the extent, structure and variety of municipal budgeting and are able to assess long term consequences of municipal revenues and spending.

Workload:

The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Ade, K., Notheis, K. & Schmid, H. (2011). *Kommunales Wirtschaftsrecht in Baden Württemberg*. Boorberg-Verlag.
- Aker, B., Hafner, W. & Notheis, K. (2012). *Gemeindeordnung Baden-Württemberg*(Kommentar). Boorberg-Verlag.
- Groh, M. (1994).Kommunalleasing und Investorenfinanzierung als Private Public Partnership.*Stadt und Gemeinde*, 49. Jahrgang, 09/94.
- Wigger, B. U. (2006).*Grundzüge der Finanzwissenschaft*. Springer-Verlag.
- Diverse Veröffentlichungen des Innenministeriums und Finanzministeriums Baden-Württemberg.

T 5.113 Course: Real Estate Management I [T-WIWI-102744]

Responsible:	Prof. Dr.-Ing. Thomas Lützkendorf
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101466 - Real Estate Management

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

Events					
WT 20/21	2586400	Real Estate Management I	2 SWS	Lecture / 📱	Lützkendorf, Worschech
WT 20/21	2586401	Übungen zu Real Estate Management I	2 SWS	Practice / 📱	Worschech
Exams					
WT 20/21	7900249	Real Estate Management I			Lützkendorf
WT 20/21	7900316	Real Estate Management I			Lützkendorf

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 two times only in the semester in which the lecture is takes place (winter semester). Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Annotation
The course is replenished by excursions and guest lectures by practicioners out of the real estate business.

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

V	**Real Estate Management I** 2586400, WS 20/21, 2 SWS, Language: German, Open in study portal	**Lecture (V)** **Online**

Content

The course Real Estate Management I deals with questions concerning the economy of a single building througout its lifecycle. Among other topics this includes project development, location and market studies, german federal building codes as well as finance and assessment of economic efficiency.

The tutorial recesses the contents of the course by means of practical examples and, in addition to that, goes into the possible use of software tools.

The course Real Estate Management I deals with questions concerning the economy of a single building througout its lifecycle. Among other topics this includes project development, location and market studies, german federal building codes as well as finance and assessment of economic efficiency.

The tutorial recesses the contents of the course by means of practical examples and, in addition to that, goes into the possible use of software tools.

The course is replenished by excursions and guest lectures by practicioners out of the real estate business.

Recommendations:

A combination with the module *Design Construction and Assessment of Green Buildings I* [WW3BWLOOW1] is recommended.

Furthermore it is recommeded to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

The **total workload** for this course is approximately 135.0 hours. For further information see German version.

The **assessment** consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place two times only in the semester in which the lecture is takes place (winter semester). Re-examinations are offered at every ordinary examination date.

Literature
Weiterführende Literatur:

- Gondring (Hrsg.): "Immobilienwirtschaft: Handbuch für Studium und Praxis". ISBN 3-8006-2989-5. Vahlen 2004
- Kühne-Büning (Hrsg.): "Grundlagen der Wohnungs- und Immobilienwirtschaft". ISBN 3-8314-0706-1. Knapp & Hammonia-Verlag 2005
- Schulte (Hrsg.): "Immobilienökonomie Bd. I". ISBN 3-486-25430-8. Oldenbourg 2000

T 5.114 Course: Real Estate Management II [T-WIWI-102745]

Responsible: Prof. Dr.-Ing. Thomas Lützkendorf
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101466 - Real Estate Management

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

Events					
ST 2021	2585400	Real Estate Management II	2 SWS	Lecture / 📱	Lützkendorf, Worschech
ST 2021	2585401	Übung zu Real Estate Management II	2 SWS	Practice / 📱	Worschech

Legend: 📱 Online, ⊗ Blended (On-Site/Online), ● On-Site, ✗ Cancelled

Competence Certificate
Depending on further pandemic developments, the exam will be offered in the summer semester 2021 either as a 60-minute upload exam (Open Book Exam @ Home), or as a 60-minute exam (written exam according to SPO § 4 Abs. 2, Pkt. 1).

Prerequisites
None

Recommendation
A combination with the module *Design Construction and Assessment of Green Buildings I* is recommended.

Furthermore it is recommeded to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

Annotation
The course is replenished by excursions and guest lectures by practicioners out of the real estate business.

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

V	**Real Estate Management II**	Lecture (V)
	2585400, SS 2021, 2 SWS, Language: German, Open in study portal	**Online**

Content

The course Real Estate Management II gives special attention to topics in connection to the management of large real estate portfolios. This especially includes property valuation, market and object rating, maintenance and modernization, as well as real estate portfolio and risk management. The tutorial provides examples in order to practice the application of theoretical knowledge to practical problems.

The course is replenished by excursions and guest lectures by practicioners out of the real estate business.

The student

- has an in-depth knowledge on the economic classification and significance of the real estate industry
- has a critical understanding of essential theories, methods and instruments of the real estate industry
- is able to analyze and evaluate activity areas and functions in real estate companies as well as to prepare or to take decisions

Recommendations:

A combination with the module *Design Construction and Assessment of Green Buildings I* [WW3BWLOOW1] is recommended.

Furthermore it is recommed to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

The total workload for this course is approximately 135.0 hours. For further information see German version.

The **assessment** consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place two times only in the semester in which the lecture is takes place (summer semester). Reexaminations are offered at every ordinary examination date.

Literature
Weiterführende Literatur:

- Gondring (Hrsg.): "Immobilienwirtschaft: Handbuch für Studium und Praxis". ISBN 3-8006-2989-5. Vahlen 2004
- Kühne-Büning (Hrsg.): "Grundlagen der Wohnungs- und Immobilienwirtschaft". ISBN 3-8314-0706-1. Knapp & Hammonia-Verlag 2005
- Schulte (Hrsg.): "Immobilienökonomie Bd. I". ISBN 3-486-25430-8. Oldenbourg 2000

T 5.115 Course: Renewable Energy-Resources, Technologies and Economics [T-WIWI-100806]

Responsible: PD Dr. Patrick Jochem
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101464 - Energy Economics

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

Events					
WT 20/21	2581012	Renewable Energy – Resources, Technologies and Economics	2 SWS	Lecture / 📱	Jochem
Exams					
WT 20/21	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 20/21, 2 SWS, Language: English, Open in study portal

Lecture (V)
Online

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
siehe Institutsaushang

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, Ill.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 5.116 Course: Robotics I - Introduction to Robotics [T-INFO-108014]

Responsible:	Prof. Dr.-Ing. Tamim Asfour
Organisation:	KIT Department of Informatics
Part of:	M-INFO-100893 - Robotics I - Introduction to Robotics

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

Events					
WT 20/21	2424152	Robotics I - Introduction to Robotics	3/1 SWS	Lecture / 🖥	Asfour
Exams					
WT 20/21	7500106	Robotics I - Introduction to Robotics			Asfour
ST 2021	7500218	Robotik I - Einführung in die Robotik			Asfour

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), 🔾 On-Site, ✗ Cancelled

T	5.117 Course: Security [T-INFO-101371]

Responsible: Prof. Dr. Dennis Hofheinz
Prof. Dr. Jörn Müller-Quade
Organisation: KIT Department of Informatics
Part of: M-INFO-100834 - Security

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

Events					
ST 2021	24941	Security	3 SWS	Lecture / 📱	Müller-Quade, Strufe
Exams					
WT 20/21	7500290	Security			Müller-Quade, Strufe
ST 2021	7524941	Security			Müller-Quade, Strufe

Legend: 📱 Online, ⚅ Blended (On-Site/Online), 🎤 On-Site, ✗ Cancelled

T 5.118 Course: Selling IT-Solutions Professionally [T-INFO-101977]

Responsible:	Prof. Dr.-Ing. Klemens Böhm
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101193 - Foundations of Information Systems
	M-INFO-101235 - Introduction to Data and Information Management

Type	Credits	Grading scale	Recurrence	Version
Completed coursework	1,5	pass/fail	Irregular	1

T	**5.119 Course: Semantic Web Technologies [T-WIWI-110848]**

Responsible:	Tobias Christof Käfer
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101438 - Semantic Knowledge Management
	M-WIWI-101440 - Information Services in Networks

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

Events					
ST 2021	2511310	Semantic Web Technologies	2 SWS	Lecture / 🖥	Färber, Käfer, Heling
ST 2021	2511311	Exercises to Semantic Web Technologies	1 SWS	Practice / 🖥	Färber, Käfer, Heling
Exams					
WT 20/21	7900022	Semantic Web Technologies (Registration until 08 February 2021)			Sure-Vetter
ST 2021	7900028	Semantic Web Technologies (Registration until 12 July 2021)			Färber

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** 2511310, SS 2021, 2 SWS, Language: English, Open in study portal	**Lecture (V)** **Online**

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** 2511311, SS 2021, 1 SWS, Language: English, Open in study portal	**Practice (Ü)** **Online**

Content

The exercises are related to the lecture Semantic Web Technologies.

Multiple exercises are held that capture the topics, held in the lecture Semantic Web Technologies, and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

The following topics are covered:

- Resource Description Framework (RDF) and RDF Schema (RDFS)
- Web Architecture and Linked Data
- Web Ontology Language (OWL)
- Query language SPARQL
- Rule languages
- Applications

Learning objectives:

The student

- understands the motivation and foundational ideas behind Semantic Web and Linked Data technologies, and is able to analyse and realise systems
- demonstrates basic competency in the areas of data and system integration on the web
- masters advanced knowledge representation scenarios involving ontologies

Recommendations:

Lectures on Informatics of the Bachelor on Information Systems (Semester 1-4) or equivalent are required. Knowledge of modeling with UML is required.

Literature

- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, York Sure: Semantic Web – Grundlagen. Springer, 2008.
- John Domingue, Dieter Fensel, James A. Hendler (Editors). Handbook of Semantic Web Technologies. Springer, 2011.

Weitere Literatur

- S. Staab, R. Studer (Editors). Handbook on Ontologies. International Handbooks in Information Systems. Springer, 2003.
- Tim Berners-Lee. Weaving the Web. Harper, 1999 geb. 2000 Taschenbuch.
- Ian Jacobs, Norman Walsh. Architecture of the World Wide Web, Volume One. W3C Recommendation 15 December 2004. http://www.w3.org/TR/webarch/
- Dean Allemang. Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL. Morgan Kaufmann, 2008.
- Tom Heath and Chris Bizer. Linked Data: Evolving the Web into a Global Data Space. Synthesis Lectures on the Semantic Web: Theory and Technology, 2011.

T 5.120 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 Examination of another type	**Credits** 3	**Grading scale** Grade to a third	**Recurrence** Each term	**Version** 1

Events					
WT 20/21	2500019	Digital Citizen Science	2 SWS	Seminar / 🖥	Weinhardt, Volkamer, Mayer
WT 20/21	2500125	Current Topics in Digital Transformation Seminar	3 SWS	Seminar / ❌	Mädche
WT 20/21	2530374	Machine Learning for Business Applications	2 SWS	Seminar / 🖥	Ulrich
WT 20/21	2530580	Seminar in Finance	2 SWS	Seminar	Uhrig-Homburg
WT 20/21	2530610	Seminar in Financial Economics	2 SWS	Seminar / 🖥	Thimme
WT 20/21	2540473	Data Science in Service Management	2 SWS	Seminar / 🖥	Haubner, Dann, Badewitz, Stoeckel
WT 20/21	2540475	Electronic Markets & User behavior	2 SWS	Seminar / 🖥	Knierim
WT 20/21	2540477	Digital Experience and Participation	2 SWS	Seminar / 🖥	Straub, Peukert, Hoffmann, Pusmaz, Willrich, Kloepper, Fegert, Greif-Winzrieth
WT 20/21	2540478	Smart Grids and Energy Markets	2 SWS	Seminar / 🖥	Staudt, Richter, Huber, vom Scheidt, Golla, Schmidt, Henni, Meinke
WT 20/21	2540524	Bachelor Seminar aus Data Science	2 SWS	Seminar	Geyer-Schulz, Schweizer, Nazemi
WT 20/21	2540557	Information Systems and Service Design Seminar	3 SWS	Seminar	Mädche
WT 20/21	2545010	Entrepreneurship Basics (Track 1)	2 SWS	Seminar / 🖥	Terzidis, Tittel
WT 20/21	2545011	Entrepreneurship Basics (Track 2)	2 SWS	Seminar / 🖥	Böhrer, Terzidis
WT 20/21	2573010	Seminar: Human Resources and Organizations (Bachelor)	2 SWS	Seminar / 🖥	Nieken, Mitarbeiter
WT 20/21	2573011	Seminar: Human Resource Management (Bachelor)	2 SWS	Seminar / 🖥	Nieken, Mitarbeiter
WT 20/21	2579919	Seminar Management Accounting - Special Topics	2 SWS	Seminar / 🍃	Riar, Wouters, Ebinger
WT 20/21	2581976	Seminar in Production and Operations Management I	2 SWS	Seminar / 🖥	Glöser-Chahoud, Schultmann
WT 20/21	2581977	Seminar in Production and Operations Management II	2 SWS	Seminar / 🖥	Volk, Schultmann
WT 20/21	2581978	Seminar in Production and Operations Management III	2 SWS	Seminar / 🖥	Wiens, Schultmann
WT 20/21	2581980		2 SWS	Seminar / 🖥	Yilmaz, Fraunholz, Dehler-Holland, Kraft
WT 20/21	2581981		2 SWS	Seminar / 🖥	Ardone, Sandmeier, Scharnhorst
WT 20/21	2581990		2 SWS	Seminar	Schumacher, Schultmann

ST 2021	2500125	Current Topics in Digital Transformation Seminar	3 SWS	Seminar / ⚙	Mädche
ST 2021	2530293	Seminar in Finance (Bachelor, Prof. Ruckes)	2 SWS	Seminar / 🖥	Ruckes, Luedecke, Hoang, Benz, Wiegratz, Strych, Silbereis
ST 2021	2530374	Machine Learning for Business Applications	2 SWS	Seminar / 🖥	Ulrich
ST 2021	2530610	Seminar Financial Economics		Seminar / 🖥	Thimme
ST 2021	2540473	Business Data Analytics	2 SWS	Seminar / 🖥	Dann, Stoeckel, Grote, Badewitz
ST 2021	2540477	Digital Experience & Participation	2 SWS	Seminar / 🖥	Peukert, Greif-Winzrieth
ST 2021	2540478	Smart Grid Economics & Energy Markets	2 SWS	Seminar / 🖥	Staudt, Huber, Richter, vom Scheidt, Golla, Henni, Schmidt, Meinke, Qu
ST 2021	2540524	Bachelor Seminar in Data Science and Machine Learning	2 SWS	Seminar / 🖥	Geyer-Schulz, Schweigert, Schweizer
ST 2021	2540557	Information Systems and Service Design Seminar	3 SWS	Seminar / 🖥	Mädche
ST 2021	2540588	Economic Psychology in Action	2 SWS	Seminar / 🖥	Liu
ST 2021	2545010	Entrepreneurship Basics (Track 1)	2 SWS	Seminar / 🖥	Eckerle, Terzidis, Hirte
ST 2021	2545011	Entrepreneurship Basics (Track 2)	2 SWS	Seminar / 🖥	Böhrer, Terzidis
ST 2021	2571180	Seminar in Marketing und Vertrieb (Master)	2 SWS	Seminar / 🖥	Klarmann, Mitarbeiter
ST 2021	2573010	Seminar Human Resources and Organizations (Bachelor)	2 SWS	Seminar / 🖥	Nieken, Mitarbeiter
ST 2021	2573011	Seminar Human Resource Management (Bachelor)	2 SWS	Seminar / 🖥	Nieken, Mitarbeiter
ST 2021	2579909	Seminar Management Accounting	2 SWS	Seminar / 🖥	Wouters, Hammann, Disch
ST 2021	2579919	Seminar in Management Accounting - Special Topics	2 SWS	Seminar / 🖥	Ebinger
ST 2021	2581030	Seminar Energiewirtschaft IV	2 SWS	Seminar / 🖥	Plötz
ST 2021	2581977	Seminar Produktionswirtschaft und Logistik II	2 SWS	Seminar / 🖥	Volk, Schultmann
ST 2021	2581980	Seminar Energiewirtschaft II	2 SWS	Seminar / 🖥	Fichtner
ST 2021	2581990		2 SWS	Seminar / 🖥	Schultmann
Exams					
WT 20/21	00042	Seminar Business Data Analytics			Weinhardt
WT 20/21	7900017	Seminar Smart Grid and Energy Markets			Weinhardt
WT 20/21	7900085	Entrepreneurship Basics (Track 1)			Terzidis
WT 20/21	7900087	Entrepreneurship Basics (Track 2)			Terzidis
WT 20/21	7900125	Current Topics in Digital Transformation Seminar			Mädche
WT 20/21	7900157	Seminar Human Resources and Organizations (Bachelor)			Nieken
WT 20/21	7900161	Seminar Human Resource Management (Bachelor)			Nieken
WT 20/21	7900165	Seminar Digital Experience and Participation			Weinhardt
WT 20/21	7900175	Seminar in Finance (Bachelor)			Uhrig-Homburg
WT 20/21	7900203	Seminar in Finance			Uhrig-Homburg
WT 20/21	7900220	Machine Learning for Business Applications			Ulrich
WT 20/21	7900233	Information Systems and Service Design Seminar			Mädche
WT 20/21	7900279	Seminar Financial Economics (Bachelor)			Thimme
WT 20/21	7900327	Electronic Markets & User behavior (Seminar)			Weinhardt
WT 20/21	7900330	Seminar Digital Citizen Science			Weinhardt
WT 20/21	79-2579919-B	Seminar Management Accounting - Special Topics (Bachelor)			Wouters

WT 20/21	7981976	Seminar in Production and Operations Management I	Schultmann
WT 20/21	7981977	Seminar in Production and Operations Management II	Schultmann
WT 20/21	7981978	Seminar in Production and Operations Management III	Schultmann
WT 20/21	7981979	Seminar in Business Administration A (Master)	Fichtner
WT 20/21	7981980	Seminar in Business Administration A (Master)	Fichtner
WT 20/21	7981981	Seminar in Business Administration (Bachelor)	Fichtner
ST 2021	00004	Seminar Financial Economics	Thimme
ST 2021	7900036	Collaborative Development of Conversational Agents	Mädche
ST 2021	7900056	Entrepreneurship Basics (Track 1)	Terzidis
ST 2021	7900057	Entrepreneurship Basics (Track 2)	Terzidis
ST 2021	7900093	Seminar in Business Administration A	Weinhardt
ST 2021	7900100	Seminar Human Resource Management (Bachelor)	Nieken
ST 2021	7900190	Current Topics in Digital Transformation Seminar	Mädche
ST 2021	7900261	Information Systems and Design (ISSD) Seminar	Mädche
ST 2021	7900265	Interactive Analytics Seminar	Mädche
ST 2021	79-2579909-B	Seminar Management Accounting (Bachelor)	Wouters
ST 2021	79-2579919-B	Seminar Management Accounting - Special Topics (Bachelor)	Wouters
ST 2021	79-2579929-B	Seminar Management Accounting - Entrepreneurship Topics (Bachelor)	Wouters
ST 2021	7981976	Seminar in Production and Operations Management I	Schultmann
ST 2021	7981977	Seminar in Production and Operations Management II	Schultmann
ST 2021	7981978	Seminar in Production and Operations Management III	Schultmann
ST 2021	7981979	Seminar Energy Economics I	Fichtner
ST 2021	7981980	Seminar Energy Economics II	Fichtner
ST 2021	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.

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

V	**Digital Citizen Science** 2500019, WS 20/21, 2 SWS, Language: German/English, Open in study portal	**Seminar (S)** **Online**

Content

Digital Citizen Science is an innovative approach to conduct field research - interactively and in the real world. Especially in times of social distancing measures essential questions about how private lives are changing are investigated. Who is experiencing more stress during HomeOffice hours? Who is flourishing while learning at home because flow is experienced more often? Which formats of digital cooperation are fostering social contacts and bonding? These and other questions that target the main topic: Well-being @Home are focused in these seminar projects.

The seminar theses are supervised by academics from multiple institutes that are working together on the topic of Digital Citizen Science arbeiten. Involved are the research groups of Prof. Mädche, Prof. Nieken, Prof. Scheibehenne, Prof. Szech, Prof. Volkamer, Prof. Weinhardt and Prof. Woll.

V	**Machine Learning for Business Applications** 2530374, WS 20/21, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **Online**

Content

Machine learning (ML) is changing virtually every aspect of our lives. Today ML algorithms accomplish tasks that until recently only expert humans could perform. As it relates to finance, this is the most exciting time to adopt a disruptive technology that will transform how everyone invests for generations.

In this seminar we will apply modern machine learning techniques hands on to various business applications.

Organizational issues

Blockseminar tba

V	**Data Science in Service Management** 2540473, WS 20/21, 2 SWS, Language: German/English, Open in study portal	**Seminar (S)** **Online**

Content

wird auf deutsch und englisch gehalten

Organizational issues

Blockveranstaltung, siehe WWW

V	**Bachelor Seminar aus Data Science** 2540524, WS 20/21, 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 20/21, 2 SWS, Language: German, Open in study portal	**Seminar (S)** **Online**

Content

The seminar introduces students to basic concepts of business planning for entrepreneurs. This involves concepts for the concretization of business ideas (development of business models), market potential estimation, resource planning, etc.) as well as the creation of an executable business plan (with or without VC financing).

The primary focus of the seminar is on working with the Business Model Canvas and developing a value proposition.

Learning objectives:

After attending, students have learned how to use a structured process to take the first steps in starting a business to identify and minimize their most important risks. In particular, they have practical experience in identifying and validating 1) relevant customer issues, 2) designing and testing solutions to these problems, 3) targeting and assessing their accessibility, and 4) their willingness to pay. In doing so, they have learned to know and apply the business model canvas, methods for developing value propositions, rapid prototyping and target group interviews. In addition, they have learned to work efficiently in a team through the use of communication strategies.

Credentials:

Registration is via the Wiwi portal.

Exam:

Presentation + active participation + paper.

Target group:

Bachelor students

V	**Entrepreneurship Basics (Track 2)** 2545011, WS 20/21, 2 SWS, Language: German, Open in study portal	**Seminar (S)** **Online**

Content

):

The seminar introduces students to basic concepts of business planning for entrepreneurs. This involves concepts for the concretization of business ideas (development of business models), market potential estimation, resource planning, etc.) as well as the creation of an executable business plan (with or without VC financing).

The primary focus of the seminar is on working with the Business Model Canvas and developing a value proposition.

Learning objectives:

After attending, students have learned how to use a structured process to take the first steps in starting a business to identify and minimize their most important risks. In particular, they have practical experience in identifying and validating 1) relevant customer issues, 2) designing and testing solutions to these problems, 3) targeting and assessing their accessibility, and 4) their willingness to pay. In doing so, they have learned to know and apply the business model canvas, methods for developing value propositions, rapid prototyping and target group interviews. In addition, they have learned to work efficiently in a team through the use of communication strategies.

Credentials:

Registration is via the Wiwi portal.

Exam:

Presentation + active participation + paper.

Target group:

Bachelor students

V	**Seminar: Human Resources and Organizations (Bachelor)** 2573010, WS 20/21, 2 SWS, Language: German, Open in study portal	**Seminar (S)** **Online**

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)** 2573011, WS 20/21, 2 SWS, Language: German, Open in study portal	**Seminar (S)** **Online**

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.

V	**Seminar Management Accounting - Special Topics** 2579919, WS 20/21, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **On-Site**

Content

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in several meetings that are spread throughout the semester.

Learning objectives:

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources.

Examination:

- The performance review is carried out in the form of a "Prüfungsleistung anderer Art" (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade of the course is the grade awarded to the paper.

Workload:

- The total workload for this course is approximately 90 hours. For further information see German version.

Note:

- Maximum of 16 students.

Literature

Will be announced in the course.

V	**Machine Learning for Business Applications** 2530374, SS 2021, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **Online**

Content

The digitalization is not only changing today's society but also companies' business models, in particular of the financial industry. In general, the large variety of digitalized processes and connected devices (Industry 4.0) generates a huge amount of data which can be used to extract valuable (investment) insights. For this task data science skills are essential.

In this seminar we will use modern data science techniques to analyze all kinds of financial and economic data, ranging from big data intra-day option prices to alternative datasets, like textual statements. For this empirical analysis we will use the state of the art Python programming language.

In a bi-weekly schedule you and your supervisor will first learn and discuss important data science concepts and then apply it in a practical FinTech-type analysis using real-world data. As a prerequisite students should already have basic finance knowledge.

Organizational issues

Blockseminar tba

V	**Information Systems and Service Design Seminar** 2540557, SS 2021, 3 SWS, Language: English, Open in study portal	**Seminar (S)** **Online**

Content

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 ISSD (Prof. Mädche). The research group "Information Systems & Service Design" (ISSD) 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	**Economic Psychology in Action** 2540588, SS 2021, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **Online**

Content
Description

This blocked event contains 3 stages.

In Stage 1, students meet online for one day and experience recent economic psychology research as participants. The research topics will mainly consist of novel economic games with certain level of strategic depth (i.e., we will not play simple games like rock paper scissors, nor we will play games that many people are familiar with like the prisoner's dilemma).

In Stage 2, students will receive the data from the games they played in Stage 1 along with a few journal articles assigned by the instructor on related topics. Based on reading, they choose one of the datasets from Stage 1 to write up a short report.

In Stage 3, students will try to design and conduct a study on a related topic themselves based on what they have learned in the previous stages. They will collect their own data and write a research report. The nature of this project is to be determined together by the students and instructor. It would either be ideas generated by the students themselves, or something assigned by the instructor.

English will be the language used in all discussions, course materials, and assessments.

Competence Certificate

The assessment is based on the short report in Stage 2 and the research report in Stage 3.

Workload

Students are expected to spend a total of 90 hours (30 hours per ECTS), including meeting and assignments, on this seminar.

Organizational issues
Blockveranstaltung, Temrine werden bekanntgegeben

| V | **Seminar Human Resources and Organizations (Bachelor)**
2573010, SS 2021, 2 SWS, Language: German, Open in study portal | **Seminar (S)**
Online |

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 2021, 2 SWS, Language: German, Open in study portal | **Seminar (S)**
Online |

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**
2579909, SS 2021, 2 SWS, Language: English, Open in study portal | **Seminar (S)**
Online |

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. You are to a large extent free to select your own topic. The seminar course is concentrated in four 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 of the course is the grade awarded to the paper.

Note:

- Maximum of 16 students.

Organizational issues

Geb.05.20, 2A-12.1; Termine werden bekannt gegeben

Literature

Will be announced in the course.

V	**Seminar in Management Accounting - Special Topics** 2579919, SS 2021, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **Online**

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 predisched. 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 of the course is the grade awarded to the paper.

Note:

- Maximum of 16 students.

Organizational issues

Geb.05.20, 2A-12.1; Termine werden bekannt gegeben

Literature

Will be announced in the course.

## T 5.121 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 Examination of another type	Credits 3	Grading scale Grade to a third	Recurrence Each term	Version 1

Events

WT 20/21	2521310	Topics in Econometrics	2 SWS	Seminar / 🖥	Schienle, Chen, Görgen, Krüger, Buse
WT 20/21	2560140	Topics in Political Economy (Bachelor)	2 SWS	Seminar / 🖥	Szech, Huber
WT 20/21	2560141	Morals & Social Behavior (Bachelor)	2 SWS	Seminar / 🖥	Szech, Zhao
WT 20/21	2560142	Topics in Political Economy (Master)	2 SWS	Seminar / 🖥	Szech, Huber
WT 20/21	2561208	Selected aspects of European transport planning and -modelling	1 SWS	Seminar / 🖥	Szimba
WT 20/21	2561281	Wirtschaftspolitisches Seminar	2 SWS	Seminar / 🖥	Ott
ST 2021	2560233	Seminar zur Luftverkehrspolitik		Seminar / 🖥	Mitusch, Wisotzky
ST 2021	2560553	Overcoming the Corona Crisis, Seminar Morals and Social Behavior (Bachelor)	2 SWS	Seminar / 🖥	Szech, Zhao
ST 2021	2560554	Markets for Attention and the Digital Economy Seminar on Topics in Political Economy (Master)	2 SWS	Seminar / 🖥	Szech, Huber

Exams

WT 20/21	7900124	Seminar Digital Markets (Bachelor)	Szech
WT 20/21	7900139	Seminar in Economics (Bachelor/Master)	Mitusch
WT 20/21	7900212	Seminar in Macroeconomics	Brumm
WT 20/21	7900254	Topics in Econometrics. Seminar in Economics	Schienle
WT 20/21	7900256	Data Mining. Seminar in Economics (Bachelor)	Nakhaeizadeh
WT 20/21	7900259	Time and Risk Preferences: Theory and Empirics	Puppe
WT 20/21	7900289	Seminar in Economics (Bachelor): Corona	Szech
WT 20/21	7900297	Topics in Experimental Economics	Reiß
WT 20/21	79sefi1	Seminar in Economics (Bachelor)	Wigger
ST 2021	7900040	Seminar in Macroeconomics I	Brumm
ST 2021	7900060	Markets for Attention and the Digital Economy (Bachelor)	Szech
ST 2021	7900130	Overcoming the Corona Crisis (Bachelor)	Szech
ST 2021	7900220	Seminar in Macroeconomics II	Brumm
ST 2021	7900248	Social Preferences in Behavioral Economics	Szech
ST 2021	79sefi1	Seminar Death, Mistake & Fraud in Science (Bachelor)	Wigger

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.

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

V	**Topics in Econometrics** 2521310, WS 20/21, 2 SWS, Language: German, Open in study portal	**Seminar (S)** **Online**

Organizational issues
Blockveranstaltung, Termine werden auf Homepage und über Ilias bekannt gegeben

V	**Topics in Political Economy (Bachelor)** 2560140, WS 20/21, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **Online**

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.

For bachelor students, grades will be based on the quality of presentation slides (25%) and the seminar paper (50%). Additionally each student will have to hand in one individual abstract of 75-100 words. The quality of abstracts will reflect with 25% in the final grade.

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.

V	**Morals & Social Behavior (Bachelor)** 2560141, WS 20/21, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **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.

For bachelor students, grades will be based on the quality of presentation slides (25%) and the seminar paper (50%). Additionally each student will have to hand in one individual abstract of 75-100 words. The quality of abstracts will reflect with 25% in the final grade.

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

V	**Topics in Political Economy (Master)** 2560142, WS 20/21, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **Online**

Content

For Master 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.

For Master students, grades will be based on the quality of presentation slides (25%) and the seminar paper (50%). Additionally each student will have to hand in two individual abstracts – one with 75-100 words and one with 150-200 words. The quality of abstracts will reflect with 25% in the final grade.

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.

V	**Overcoming the Corona Crisis, Seminar Morals and Social Behavior (Bachelor)** 2560553, SS 2021, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **Online**

Content
Participation will be limited to 12 students.

Organizational issues
Blockveranstaltung

V	**Markets for Attention and the Digital Economy Seminar on Topics in Political Economy (Master)** 2560554, SS 2021, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **Online**

Content

For Master 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

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 8–10 pages are to be handed in.

Students' grades will be based on the quality of presentations in the seminar (40%) and the seminar paper (40%). Additionally students will have to hand in two abstracts with different lenghts (20%). Students can improve their grades by 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
Blockveranstaltung

T 5.122 Course: Seminar in Informatics (Bachelor) [T-WIWI-103485]

|	
Responsible:	Professorenschaft des Fachbereichs Informatik
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 20/21	2513200	Seminar Programming 3 (Bachelor)	2 SWS	Seminar / 🖥	Oberweis, Zöllner, Frister, Fritsch, Struppek, Forell
WT 20/21	2513214	Seminar Information security and data protection (Bachelor)	2 SWS	Seminar / 🖥	Oberweis, Volkamer, Raabe, Alpers, Düzgün, Schiefer, Wagner
WT 20/21	2513312	Seminar Linked Data and the Semantic Web (Bachelor)	2 SWS	Seminar / 🖥	Färber, Käfer, Heling, Bartscherer
WT 20/21	2513313	Seminar Linked Data and the Semantic Web (Master)	2 SWS	Seminar / 🖥	Färber, Käfer, Heling, Bartscherer
WT 20/21	2513314	Seminar Real-World Challenges in Data Science and Analytics (Bachelor)	3 SWS	Seminar / 🖥	Nickel, Weinhardt, Färber, Zehnder, Brandt
WT 20/21	2513315	Seminar Real-World Challenges in Data Science and Analytics (Master)	3 SWS	Seminar / 🖥	Nickel, Weinhardt, Färber, Zehnder, Brandt
WT 20/21	2513500	Seminar Cognitive Automobiles and Robots (Master)	2 SWS	Seminar / 🖥	Zöllner
WT 20/21	2513550	Seminar Security, Usability and Society (Bachelor)	2 SWS	Seminar / 🖥	Volkamer, Aldag, Düzgün, Mayer, Mossano, Berens
ST 2021	2513308	Seminar Knowledge Discovery and Data Mining (Bachelor)	3 SWS	Seminar / 🖥	Färber, Nguyen, Noullet, Saier, Bartscherer
ST 2021	2513310	Seminar Data Science & Real-time Big Data Analytics (Bachelor)	2 SWS	Seminar / 🖥	Färber, Riemer, Heyden , Käfer
ST 2021	2513402	Seminar Emerging Trends in Internet Technologies (Bachelor)	2 SWS	Seminar / 🖥	Sunyaev, Thiebes, Lins
ST 2021	2513404	Seminar Emerging Trends in Digital Health (Bachelor)	2 SWS	Seminar / 🖥	Lins, Sunyaev, Thiebes
ST 2021	2513500	Cognitive Automobiles and Robots	2 SWS	Seminar / 🖥	Zöllner

Exams

WT 20/21	7900002	Seminar Data Science & Real-time Big Data Analytics (Bachelor)	Sure-Vetter
WT 20/21	7900038	Seminar Linked Data and the Semantic Web (Bachelor)	Sure-Vetter
WT 20/21	7900042	Seminar Programming 3 (Bachelor)	Oberweis
WT 20/21	7900121	Seminar Information Security and Privacy (Bachelor)	Volkamer
WT 20/21	7900129	Seminar Security and Privacy Awareness	Volkamer
WT 20/21	7900185	Seminar Security, Usability and Society (Bachelor)	Volkamer
WT 20/21	7900187	Seminar Real-World Challenges in Data Science and Analytics (Bachelor)	Sure-Vetter
ST 2021	7900090	Seminar Data Science & Real-time Big Data Analytics (Bachelor)	Sure-Vetter
ST 2021	7900094	Seminar Knowledge Discovery and Data Mining (Bachelor)	Sure-Vetter
ST 2021	7900136	Seminar Emerging Trends in Digital Health (Bachelor)	Sunyaev
ST 2021	7900187	Seminar Emerging Trends in Internet Technologies (Bachelor)	Sunyaev

ST 2021	7900265	Interactive Analytics Seminar	Mädche

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.

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

V	**Seminar Programming 3 (Bachelor)** 2513200, WS 20/21, 2 SWS, Open in study portal	**Seminar (S)** **Online**

Content

Registration information and the content of the seminar will be announced on the course page. Only bachelor students are allowed to attend this seminar.

V	**Seminar Linked Data and the Semantic Web (Bachelor)** 2513312, WS 20/21, 2 SWS, Language: German/English, Open in study portal	**Seminar (S)** **Online**

Content

Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this 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 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 Linked Data and the Semantic Web (Master)**
2513313, WS 20/21, 2 SWS, Language: German/English, Open in study portal | **Seminar (S)**
Online |

Content

Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this 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 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)**
2513314, WS 20/21, 3 SWS, Language: German/English, Open in study portal | **Seminar (S)**
Online |

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)**
2513315, WS 20/21, 3 SWS, Language: German/English, Open in study portal | **Seminar (S)**
Online |

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 Cognitive Automobiles and Robots (Master)**
2513500, WS 20/21, 2 SWS, Language: German/English, Open in study portal | **Seminar (S)**
Online |

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.

V	**Seminar Knowledge Discovery and Data Mining (Bachelor)**	**Seminar (S)**
	2513308, SS 2021, 3 SWS, Language: English, Open in study portal	**Online**

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

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/.

Für weitere Fragen bezüglich des Seminar und der behandelten Themen wenden Sie sich bitte an die entsprechenden Verantwortlichen.

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)**	**Seminar (S)**
	2513310, SS 2021, 2 SWS, Language: English, Open in study portal	**Online**

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

Further information as well as the registration form can be found under the following link:
http://seminar-cep.fzi.de

Questions are answered via the e-mail address sem-ep@fzi.de.

V	**Cognitive Automobiles and Robots** 2513500, SS 2021, 2 SWS, Language: German/English, Open in study portal	**Seminar (S)** **Online**

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   5.123 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 20/21	2550131	Seminar on Methodical Foundations of Operations Research	2 SWS	Seminar / 🖥	Stein, Neumann
WT 20/21	2550132	Seminar zur Mathematischen Optimierung (MA)	2 SWS	Seminar	Stein, Neumann
WT 20/21	2550472	Seminar on Power Systems Optimization (Bachelor)	2 SWS	Seminar / 🖥	Rebennack, Warwicker
WT 20/21	2550491	Seminar: Modern OR and Innovative Logistics	2 SWS	Seminar / 🖥	Nickel, Mitarbeiter
ST 2021	2550132	Seminar zur Mathematischen Optimierung (MA)	2 SWS	Seminar / 🖥	Stein, Beck, Neumann, Schwarze
ST 2021	2550472	Seminar on Power Systems Optimization (Bachelor)	2 SWS	Seminar / 🖥	Rebennack, Warwicker, Sinske
ST 2021	2550491	Seminar: Modern OR and Innovative Logistics	2 SWS	Seminar / 🖥	Nickel, Mitarbeiter
Exams					
WT 20/21	7900011_WS2021	Seminar in Operations Research B (Bachelor)			Stein
WT 20/21	7900012_WS2021	Seminar in Operations Research A (Master)			Stein
WT 20/21	7900108	Seminar: Modern OR and Innovative Logistics			Nickel
WT 20/21	7900282	Digitization in the Steel Industry			Nickel
WT 20/21	7900313	Seminar in Operations Research (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.

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

| V | **Seminar on Methodical Foundations of Operations Research**
2550131, WS 20/21, 2 SWS, Language: German, Open in study portal | **Seminar (S)**
Online |

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.

Organizational issues

Blockveranstaltung, Termin n. V.

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, WS 20/21, 2 SWS, Language: German, Open in study portal | **Seminar (S)**
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

wird auf der Homepage bekannt gegeben

Literature

Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.

| V | **Seminar: Modern OR and Innovative Logistics**
2550491, SS 2021, 2 SWS, Language: German, Open in study portal | **Seminar (S)**
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 5.124 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 20/21	2521310	Topics in Econometrics	2 SWS	Seminar / 🖳	Schienle, Chen, Görgen, Krüger, Buse
Exams					
WT 20/21	7900256	Data Mining. Seminar in Economics (Bachelor)			Nakhaeizadeh

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.

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

V	**Topics in Econometrics**	Seminar (S)
	2521310, WS 20/21, 2 SWS, Language: German, Open in study portal	Online

Organizational issues
Blockveranstaltung, Termine werden auf Homepage und über Ilias bekannt gegeben

T 5.125 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 Examination of another type	**Credits** 3	**Grading scale** Grade to a third	**Version** 1

Events					
WT 20/21	2400072	Seminar: Service-oriented Architectures		Seminar / 🖥	Abeck, Schneider
WT 20/21	2400078	Seminar: Neuronale Netze und künstliche Intelligenz		Seminar / 🖥	Waibel, Stüker, Asfour, HA
WT 20/21	24844	Seminar: Ubiquitous Systems	2 SWS	Seminar / 🖥	Beigl, Pescara
ST 2021	2400011	Hot Topics in Bioinformatics	2 SWS	Seminar / 🖥	Stamatakis
ST 2021	2400072	Seminar: Service-oriented Architectures		Seminar / 🖥	Abeck, Schneider
ST 2021	2400144	Can Statistics Prove Cause and Effect?	2 SWS	Seminar / 🖥	Janzing
ST 2021	24344	Advanced Methods of Information Fusion	2 SWS	Seminar / 🖥	Hanebeck, Radtke
Exams					
WT 20/21	7500021	Advanced Methods of Information Fusion			Hanebeck
WT 20/21	7500122	CES - Seminar: Machine Learning			Henkel
WT 20/21	7500175	Seminar: Energy Informatics			Wagner
WT 20/21	7500220	Seminar Ubiquitous Computing			Beigl
WT 20/21	7500257	Seminar Big Data Tools			Streit
WT 20/21	7500267	Seminar Advanced Topics in Machine Translation			Waibel
WT 20/21	75104740	Seminar: Service-Oriented Architectures			Abeck
ST 2021	7500013	Advanced Methods of Information Fusion			Hanebeck, Noack
ST 2021	7500014	Seminar: Hot Topics in Bioinformatics			Stamatakis
ST 2021	7500148	Proseminar: Practical Seminar: Interactive Analytics			Beigl, Mädche
ST 2021	7500162	Seminar: Ubiquitous Systems			Beigl, Riedel
ST 2021	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 Seminar: Neuronale Netze und künstliche Intelligenz
2400078, WS 20/21, SWS, Language: German/English, Open in study portal

Seminar (S)
Online

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

Organizational issues

Die Anmeldung zum Seminar erfolgt über die Anmeldung zur Veranstaltung im Campus-System.

V	**Hot Topics in Bioinformatics** 2400011, SS 2021, 2 SWS, Language: English, Open in study portal	**Seminar (S)** **Online**

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.

All information on the seminar is provided at: Seminar page Information about how we will start virtually is also provided there. We will start in the first week of the summer term. For all further information, students are requested to regularly read their emails.

V	**Advanced Methods of Information Fusion** 24344, SS 2021, 2 SWS, Language: German/English, Open in study portal	**Seminar (S)** **Online**

Content

The growing spread and performance of modern information and communication technologies produces an ever-increasing amount data .It is one of the central challenges of our time to extract meaningful information from these data sets. The approach to address these issues, often called data science, combines strategies and methods from the fields of machine learning, mathematics, state estimation, visualization and pattern recognition. During this seminar, the students will familiarize themselves with concepts and methods particularly focusing on estimation theory and its application

The seminar targets master students in computer science and bachelor students in Information engineering and management.

T 5.126 Course: Seminar: Legal Studies I [T-INFO-101997]

Responsible:	Prof. Dr. Thomas Dreier
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 20/21	2400060	Data in Software-Intensive Technical Systems – Modeling – Analysis – Protection	2 SWS	Seminar / 🖥	Reussner, Raabe, Müller-Quade
WT 20/21	2400133	Hate speech & Fake news – Das öffentliche Recht in der „postrationalen Konstellation"?	2 SWS	Seminar / 🖥	Eichenhofer
WT 20/21	2400240	Grundfragen Ethik und IT	2 SWS	Seminar / 🖥	Dreier
WT 20/21	24389	IT-Sicherheit und Recht	2 SWS	Seminar / 🖥	Schallbruch
WT 20/21	2513214	Seminar Information security and data protection (Bachelor)	2 SWS	Seminar / 🖥	Oberweis, Volkamer, Raabe, Alpers, Düzgün, Schiefer, Wagner
ST 2021	2400041	Governance, Risk & Compliance	2 SWS	Seminar / 🖥	Herzig
ST 2021	2400061	Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung	2 SWS	Seminar / 🖥	Bless, Boehm, Hartenstein, Mädche, Sunyaev, Zitterbart, Volkamer
ST 2021	2400065	"Die Corona-Krise aus der Sicht des Verfassungsrechts"	2 SWS	Seminar / 🖥	Eichenhofer
ST 2021	2400082	"Verfassungsrechtliche Fragen staatlicher Öffentlichkeitsarbeit"	2 SWS	Seminar / 🖥	Eichenhofer
ST 2021	2400127	Aktuelle Probleme des Datenschutzrechts		Seminar / 🖥	Eichenhofer
ST 2021	2400153	Technische Aspekte der DSGVO und deren Umsetzung in der Praxis	2 SWS	Seminar / 🖥	Boehm, Dimitrova
ST 2021	24820	Current Issues in Patent Law	2 SWS	Seminar / 🖥	Melullis

Exams

WT 20/21	7500035	Seminar: Legal Studies II		Eichenhofer
WT 20/21	7500182	Seminar: Legal Studies II		Dreier, Boehm, Raabe
WT 20/21	7500232	Seminar Data in Software-Intensive Technical Systems – Modeling – Analysis – Protection		Reussner
ST 2021	7500140	Seminar: Legal Studies I		Dreier, Boehm, Melullis, Matz
ST 2021	7500159	Seminar: Legal Studies I		Eichenhofer

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

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

V Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung
2400061, SS 2021, 2 SWS, Open in study portal

Seminar (S) Online

Content

- Registration via https://portal.wiwi.kit.edu/ys/4516

Organizational issues
nach Vereinbarung

T	**5.127 Course: Software Engineering I [T-INFO-101968]**

Responsible:	Prof. Dr.-Ing. Anne Koziolek
	Prof. Dr. Ralf Reussner
	Prof. Dr. Walter Tichy
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 2021	24518	Softwaretechnik I	4 SWS	Lecture / Practice (/ 🖥	Tichy, Gerking, Hey
Exams					
ST 2021	7500152	Software Engineering I			Tichy

Legend: 🖥 Online, ⚙ Blended (On-Site/Online), ● On-Site, ✗ Cancelled

| T | **5.128 Course: Software Engineering I Pass [T-INFO-101995]** |

Responsible:	Prof. Dr. Walter Tichy
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101175 - Software Engineering I

Type Completed coursework	**Credits** 0	**Grading scale** pass/fail	**Recurrence** Each summer term	**Version** 1

Events					
ST 2021	24518	Softwaretechnik I	4 SWS	Lecture / Practice (/ 🖥	Tichy, Gerking, Hey

Legend: 🖥 Online, ✳ Blended (On-Site/Online), ◗ On-Site, ✗ Cancelled

| T | **5.129 Course: Software Engineering II [T-INFO-101370]** |

Responsible:	Prof. Dr.-Ing. Anne Koziolek
	Prof. Dr. Ralf Reussner
	Prof. Dr. Walter Tichy
Organisation:	KIT Department of Informatics
Part of:	M-INFO-100833 - Software Engineering II

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

Events					
WT 20/21	24076	Software Engineering II	4 SWS	Lecture / 📱	Reussner
Exams					
WT 20/21	7500054	Software Engineering II			Reussner
WT 20/21	7500255	Software Engineering II			Reussner
ST 2021	7500235	Software Engineering II			Reussner

Legend: 📱 Online, ⚙ Blended (On-Site/Online), 🎤 On-Site, ✗ Cancelled

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

| V | **Software Engineering II** | **Lecture (V)** |
| | 24076, WS 20/21, 4 SWS, Language: German, Open in study portal | **Online** |

Literature
Craig Larman, Applying UML and Patterns, 3rd edition, Prentice Hall, 2004. Weitere Literaturhinweise werden in der Vorlesung gegeben.

T 5.130 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

Exams			
WT 20/21	7900263	Special Topics in Information Systems	Weinhardt

Competence Certificate

The assessment of this course is according to §4(2), 3 SPO in form of a written documentation, a presentation of the outcome of the conducted pracitcal 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 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

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	**5.131 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-101599 - Statistics and Econometrics

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

Events					
WT 20/21	2521350	Statistical Modeling of Generalized Regression Models	2 SWS	Lecture / 🗣	Heller
Exams					
WT 20/21	7900146	Statistical Modeling of generalized regression models			Heller

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.

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 20/21, 2 SWS, Open in study portal	Lecture (V) On-Site

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 5.132 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 2021	2600008	Statistics I	4 SWS	Lecture / 🖥	Schienle
Exams					
WT 20/21	7900086	Statistics I			Grothe
ST 2021	7900222	Statistics I			Schienle

Legend: 🖥 Online, ⬡ Blended (On-Site/Online), ● On-Site, ✗ Cancelled

Competence Certificate

Depending on further pandemic developments, the examination will be offered in the summer semester 2021 either as a 120-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	**Statistics I**	Lecture (V)
	2600008, SS 2021, 4 SWS, Language: German, Open in study portal	Online

Content

Learning objectives:

The Student understands and applies

- the basic concepts of statistical data exploration,
- the 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

Skriptum: Kurzfassung Statistik I

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 5.133 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 20/21	2610020	Statistics II	4 SWS	Lecture / 🖥	Grothe
WT 20/21	2610021		2 SWS	Tutorial (/ 🖥	Grothe, KIT
WT 20/21	2610022	PC-Praktikum zu Statistik II	2 SWS	/ 🖥	Grothe, KIT
Exams					
WT 20/21	7900340	Statistics II			Grothe
WT 20/21	7900366	Statistics II			Grothe

Legend: 🖥 Online, 🔀 Blended (On-Site/Online), 🌐 On-Site, ✗ Cancelled

Competence Certificate

The assessment consists of a written exam according to Section 4 (2), 1 of the examination regulation.

The exam takes place at the end of the lecture period or at the beginning of the recess period. The re-examination takes place in the following semester.

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 20/21, 4 SWS, Language: German, Open in study portal

Lecture (V)
Online

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 | **5.134 Course: Strategic Finance and Technoloy Change [T-WIWI-110511]** |

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

Exams			
WT 20/21	7900219	Strategic Finance and Technoloy Change	Ruckes

Competence Certificate
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation. The exam is offered each semester. If there are only a small number of participants registered for the exam, we reserve the right to hold an oral examination instead of a written one.

Prerequisites
None

Recommendation
Attending the lecture "Financial Management" is strongly recommended.

T 5.135 Course: Supplement Applied Informatics [T-WIWI-110711]

Responsible:	Professorenschaft des Fachbereichs Informatik
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 according to §4(2) of the examination regulation.

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.

| T | 5.136 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-101413 - Applications of Operations Research
M-WIWI-101421 - Supply Chain Management
M-WIWI-103337 - Optimization under Uncertainty

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

Events					
ST 2021	2550486	Taktisches und operatives SCM	2 SWS	Lecture / 🖥	Nickel
ST 2021	2550487	Übungen zu Taktisches und operatives SCM	1 SWS	Practice / 🖥	Pomes, Bakker
Exams					
WT 20/21	7900342	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 in the summer semester 2021 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 | **Taktisches und operatives SCM** | Lecture (V) |
| | 2550486, SS 2021, 2 SWS, Language: German, Open in study portal | Online |

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.

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 5.137 Course: Telematics [T-INFO-101338]

Responsible:	Prof. Dr. Martina Zitterbart
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101194 - Telematics

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

Events					
WT 20/21	24128	Telematics	3 SWS	Lecture / ▯	Bauer, Friebe, Heseding, Hock, Zitterbart
Exams					
WT 20/21	7500166	Telematics			Zitterbart
ST 2021	7500115	Telematics			Zitterbart

Legend: ▯ Online, ⚃ Blended (On-Site/Online), ◖ On-Site, ✗ Cancelled

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

V	**Telematics**	Lecture (V)
	24128, WS 20/21, 3 SWS, Language: German, Open in study portal	Online

Content

The lecture covers (i.a.) protocols, architectures, as well as methods and algorithms, for routing and establishing reliable end-to-end connections in the Internet. In addition to various methods for media access control in local area networks, the lecture also covers other communication systems, e.g. circuit-switched systems such as ISDN. Participants should also have understood the possibilities for managing and administering networks.

Familiary with the contents of the lecture *Einführung in Rechnernetze* or comparable lectures is assumed.

Learning Objectives

After attending this lecture, the students will

- have a profound understanding of protocols, architectures, as well as procedures and algorithms used for routing and for establishing reliable end-to-end connections in the Internet
- have a profound understanding of different media access control procedures in local networks and other communication systems like circuit-switched ISDN
- have a profound understanding of the problems that arise in large scale dynamic communication systems and are familiar with mechanism to deal with these problems
- be familiar with current developments such as SDN and data center networking
- be familiar with different aspects and possibilities for network management and administration

Students have a profound understanding of the basic protocol mechanisms that are necessary to establish reliable end-to-end communication. Students have detailed knowledge about the congestion and flow control mechanisms used in TCP and can discuss fairness issue in the context of multiple parallel transport streams. Students can analytically determine the performance of transport protocols and know techniques for dealing with specific constraints in the context of TCP, e.g., high data rates and low latencies. Students are familiar with current topics such as the problem of middle boxes on the Internet, the usage of TCP in data centers or multipath TCP. Students are also familiar with practical aspects of modern transport protocols and know practical ways to overcome heterogeneity in the development of distributed applications.

Students know the functions of (Internet) routing and routers and can explain and apply common routing algorithms. Students are familiar with routing architectures and different alternatives for buffer placement as well as their advantages and disadvantages. Students understand the classification into interior and exterior gateway protocols and have in-depth knowledge of the functionality and features of common protocols such as RIP, OSPF, and BGP. Students are also familiar with current topics such as label switching, IPv6 and SDN.

Students know the function of media access control and are able to classify and analytically evaluate different media access control mechanisms. Students have an in-depth knowledge of Ethernet and various Ethernet variants and characteristics, which especially includes current developments such as real-time Ethernet and data center Ethernet. Students can explain and apply the Spanning Tree Protocol.

Students know the architecture of ISDN and can reproduce the peculiarities of setting up the ISDN subscriber line. Students are familiar with the technical features of DSL.

Literature

S. Keshav. An Engineering Approach to Computer Networking. Addison-Wesley, 1997 J.F. Kurose, K.W. Ross. Computer Networking: A Top-Down Approach Featuring the Internet. 4rd Edition, Addison-Wesley, 2007 W. Stallings. Data and Computer Communications. 8th Edition, Prentice Hall, 2006 Weiterführende Literatur •D. Bertsekas, R. Gallager. Data Networks. 2nd Edition, Prentice-Hall, 1991 •F. Halsall. Data Communications, Computer Networks and Open Systems. 4th Edition, Addison-Wesley Publishing Company, 1996 •W. Haaß. Handbuch der Kommunikationsnetze. Springer, 1997 •A.S. Tanenbaum. Computer-Networks. 4th Edition, Prentice-Hall, 2004 •Internet-Standards •Artikel in Fachzeitschriften

T   5.138 Course: Theoretical Foundations of Computer Science [T-INFO-103235]

|	
Responsible:	Prof. Dr. Jörn Müller-Quade
	Prof. Dr. Peter Sanders
	Prof. Dr. Dorothea Wagner
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 20/21	24005	Theoretical Foundations of Computer Science	3 SWS	Lecture / 📱	Ueckerdt, Sauer, Brückner
Exams					
WT 20/21	7500251	Theoretical Foundations of Computer Science			Ueckerdt
ST 2021	7500314	Theoretical Foundations of Computer Science			Ueckerdt

Legend: 📱 Online, 🔀 Blended (On-Site/Online), ✊ On-Site, ✗ Cancelled

T 5.139 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 20/21	24153	Web Applications and Service-oriented Architectures (I)	2 SWS	Lecture / 📱	Abeck, Schneider, Hippchen, Throner
Exams					
WT 20/21	7500026	Web Applications and Service-oriented Architectures (I)			Abeck

Legend: 📱 Online, ⚜ Blended (On-Site/Online), ♟ On-Site, ✗ Cancelled

T   5.140 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 2021	2520517	Welfare Economics	2 SWS	Lecture / ▤	Puppe, Rollmann
ST 2021	2520518	Übung zur Wohlfahrtstheorie	1 SWS	Practice / ▤	Puppe, Rollmann

Legend: ▤ Online, ⚄ Blended (On-Site/Online), ● On-Site, ✗ Cancelled

Competence Certificate

Depending on further pandemic developments, the examination will be offered in the summer semester 2021 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

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 2021.

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

V   Welfare Economics
2520517, SS 2021, 2 SWS, Language: German, Open in study portal

Lecture (V)
Online

Content

The lecture "Welfare economics" deals with the question of efficiency and distributional properties of economic allocations, in particular allocations of market equilibria. The lecture is based on the two welfare theorems: The first welfare theorem (under weak preconditions) says that every competitive equilibrium is efficient.

According to the second welfare theorem (under stronger preconditions), every efficient allocation can be preserved as a competitive equilibrium through adequate choices of initial endowments. Afterwards, the terms and definitions of envy-freeness and the related concept of egalitarian equivalence in the context of the general theory of equilibrium will be discussed.

The second part of the lecture deals with the principle of "social justice" (i.e. distributational justice).The fundamental principles of utilitarism, Rawl's theory of justice as well as John Roemer's theory of equality of opportunity are explained and critically analyzed.

The assessment consists of a written exam at the end of the semester (according to Section 4 (2), 1 or 2 of the examination regulation).

The course will be held every two years in the summer.

The total workload for this course is approximately 135 hours. For further information see German version.

Elective literature:

- J. Rawls: *A Theory of Justice.* Harvard University Press (1971)
- J. Roemer: *Theories of Distributive Justice.* Harvard University Press (1996)

Literature
Weiterführende Literatur:

- J. Rawls: *A Theory of Justice.* Harvard University Press (1971)
- J. Roemer: *Theories of Distributive Justice.* Harvard University Press (1996)