

# Module Handbook Information Engineering and Management M.Sc.

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KIT DEPARTMENT OF ECONOMICS AND MANAGEMENT / KIT DEPARTMENT OF INFORMATICS



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6.202. Parallel Algorithms - T-INFO-101333 .....	422
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6.213. Practical Course: Database Systems - T-INFO-103201 .....	433
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6.299. Theory of Endogenous Growth - T-WIWI-102785 .....	554
6.300. Topics in Experimental Economics - T-WIWI-102863 .....	556
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6.302. Transport Economics - T-WIWI-100007 .....	558
6.303. Ubiquitous Computing - T-INFO-101326 .....	559
6.304. Valuation - T-WIWI-102621 .....	560
6.305. Wearable Robotic Technologies - T-INFO-106557 .....	561
6.306. Web Applications and Service-Oriented Architectures (II) - T-INFO-101271 .....	562
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## 1 Welcome to the new module handbook of your study programme

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!

The following contact persons are at your disposal for questions and problems at any time.

For modules and courses with INFO-Id:



**KIT Department of Informatics, Informatics Study Program Service**  
Personal counselling

☎ +49 721 608-44031  
✉ [bachelor@wirtschaftsinformatik.kit.edu](mailto:bachelor@wirtschaftsinformatik.kit.edu)

For modules and courses with WIWI-Id



**KIT Department of Economics and Management, Examination Office**  
Personal counselling

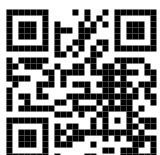
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<https://www.wiwi.kit.edu/>

## 2 About this handbook

### 2.1 Notes and rules

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).

#### 2.1.1 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.

#### 2.1.2 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](http://www.wiwi.kit.edu/Archiv_MHB.php).

#### 2.1.3 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 examination. 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>.

#### 2.1.4 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.

#### 2.1.5 Repeating exams

Principally, a failed written exam, oral exam or alternative exam assessment can be 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 losing the examination claim. A counseling interview is mandatory.

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

### 2.1.6 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.

### 2.1.7 Allocation of places for courses with a limited number of participants

The allocation of places in courses with a limited number of participants will be based on preferences and suitability for the topics. Among other things, professional and practical experience in the subject area as well as foreign language skills, if applicable, play a role. Students with the highest academic progress will be given preferential admission. Places are usually allocated via the WIWI portal at <https://portal.wiwi.kit.edu/>.

### 2.1.8 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.

### 2.1.9 Further information

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>).

## 2.2 Contact persons

#### for Bachelor students

**Personal consultation:** KIT Department of Informatics, Informatics Study Program Service  
Informatics Building 50.34, EG, Rooms 001.2/.3  
[bachelor@wirtschaftsinformatik.kit.edu](mailto:bachelor@wirtschaftsinformatik.kit.edu)

#### for master students

**Personal consultation:** KIT Department of Economics and Management, Examination Office  
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## 3 The Master's degree program in Information Engineering and Management

### 3.1 Qualification objectives of the Master's program in Information Engineering and Management

Graduates of the interdisciplinary, four-semester Master's program in Information Engineering and Management have an advanced and in-depth research-based knowledge in the fields of informatics, economics and law as well as subject-independent competences that can be applied across multiple disciplines.

By combining their knowledge and competences, they are in a position to independently acknowledge economic and IT opportunities and development potentials for innovative change of structures and processes and implement them within the applicable legal framework. They are able to analyze, structure and describe complex, field-related problems and challenges.

They know how to identify advantages and disadvantages of existing procedures, models, technologies and approaches, compare alternatives, evaluate critically and apply the findings to new application areas.

If necessary, they are also in a position to combine different approaches, adapt them accordingly or even independently develop and apply new and innovative solutions.

They know how to critically interpret, validate and illustrate the achieved results.

Their decisions are made independently based on scientific facts under consideration of social and ethical aspects.

The graduates can communicate with expert representatives on a scientific level and even assume prominent responsibility in a team. Karlsruhe's Infonomics experts are characterized by their interdisciplinary methodological skills and innovative abilities.

Their qualifications are perfectly ideal particularly for interdisciplinary occupations in the fields of Information and Communication Technology (ICT), controlling, consulting, management and organization, for starting and management of firms as well as a downstream scientific career (PhD).

### 3.2 Structure of the Master's degree program in Information Engineering and Management SPO 2015

The Master's degree program in **Information Engineering and Management** has 4 terms. The terms 1 to 3 of the program are method-oriented and provide the students with state-of-the-art knowledge in informatics, business administration, operations research, economics, statistics and law. The interdisciplinary approach is especially emphasized in the interdisciplinary seminar.

It is recommended to study the courses in the following sequence:

- The (mandatory) modules in business administration and operations research should be studied in the first two terms of the program.
- The interdisciplinary seminar module should be taken until the end of the third term of the program.
- The (elective) modules from business administration, economics, operations research, and statistics, from informatics, and from law should be studied in the first three terms of the program.
- The 4-th term is reserved for the Master Thesis in which the student proves his ability for independent scientific research in informatics, the economic sciences, and law.

Figure 2 shows a summary of this recommendation with the structure of the disciplines and with credit points allocated to the modules of the program.

Term	Credits	Informatics				Economics and Management				Law	Research Course	Master Thesis
		Electives		BUS 10 CP	OR 5 CP	BUS 9 CP	BUS/ECON/ OR/STAT 9 CP	Electives				
1	27	INFO 8 CP	INFO 8 CP									
2	30,5			INFO 8 CP					Law 9 CP			
3	32,5									2 Seminars 3 CP + 3 CP		
4	30										Master Thesis 30 CP	
120												

Figure 2: Structure of the Master's degree program in Information Engineering and Management SPO 2015 (Recommendation)

## 4 Field of study structure

<b>Mandatory</b>	
Master Thesis	30 CR
Informatics	33 CR
Economics and Management	33 CR
Law	18 CR
Research Course	6 CR

### 4.1 Master Thesis

**Credits**  
30

<b>Mandatory</b>	
M-WIWI-101656	Module Master Thesis 30 CR

## 4.2 Informatics

Credits  
33

Election block: Informatics (at least 33 credits)		
M-INFO-101199	Advanced Algorithms: Design and Analysis	9 CR
M-INFO-101200	Advanced Algorithms: Engineering and Applications	9 CR
M-INFO-100795	Algorithm Engineering	5 CR
M-INFO-100031	Algorithms for Routing	5 CR
M-INFO-100797	Algorithms in Cellular Automata	5 CR
M-INFO-102094	Algorithms for Visualization of Graphs	5 CR
M-INFO-101173	Algorithms II	6 CR
M-INFO-102110	Computational Geometry	5 CR
M-INFO-101237	Algorithmic Methods for Hard Optimization Problems	5 CR
M-INFO-102400	Algorithmic Methods for Network Analysis	5 CR
M-INFO-100768	Big Data Analytics	5 CR
M-INFO-102773	Big Data Analytics 2	3 CR
M-INFO-101256	Theory and Practice of Data Warehousing and Mining	9 CR
M-INFO-103294	Wearable Robotic Technologies	4 CR
M-WIWI-105366	Artificial Intelligence <small>neu</small>	9 CR
M-INFO-104447	Automated Planning and Scheduling	5 CR
M-INFO-100826	Automated Visual Inspection and Image Processing	6 CR
M-INFO-101251	Autonomous Robotics	9 CR
M-INFO-100755	Image Data Compression	3 CR
M-WIWI-104403	Critical Digital Infrastructures	9 CR
M-INFO-100780	Deployment of Database Systems	5 CR
M-INFO-101662	Practical Course: Database Systems	4 CR
M-INFO-100769	Datamanagement in the Cloud	5 CR
M-INFO-104045	Data Privacy: From Anonymization to Access Control	3 CR
M-INFO-104460	Deep Learning and Neural Networks	6 CR
M-INFO-102978	Digital Circuits Design	6 CR
M-INFO-101210	Dynamic IT-Infrastructures	9 CR
M-INFO-100736	Introduction to Video Analysis	3 CR
M-WIWI-101477	Development of Business Information Systems	9 CR
M-INFO-100799	Formal Systems	6 CR
M-INFO-100744	Formal Systems II: Application	5 CR
M-INFO-100841	Formal Systems II: Theory	5 CR
M-INFO-101198	Advanced Topics in Cryptography	9 CR
M-INFO-101205	Future Networking	8 CR
M-INFO-100730	Geometric Optimization	3 CR
M-WIWI-104520	Human Factors in Security and Privacy	9 CR
M-INFO-101208	Innovative Concepts of Data and Information Management	8 CR
M-WIWI-101456	Intelligent Systems and Services	9 CR
M-INFO-100819	Cognitive Systems	6 CR
M-INFO-101178	Communication and Database Systems	8 CR
M-INFO-101575	Computational Complexity Theory, with a View Towards Cryptography	6 CR
M-INFO-100728	Context Sensitive Systems	5 CR
M-INFO-101239	Machine Vision	9 CR
M-WIWI-103356	Machine Learning	9 CR
M-INFO-100729	Human Computer Interaction	6 CR
M-INFO-104061	Microservice-Based Web Applications	8 CR



M-INFO-100785	Mobile Communication	4 CR
M-INFO-100828	Models of Parallel Processing	5 CR
M-INFO-100825	Pattern Recognition	3 CR
M-INFO-101206	Networking	8 CR
M-INFO-101204	Networking Labs	9 CR
M-INFO-100812	Meshes and Point Clouds	3 CR
M-INFO-100782	Network Security: Architectures and Protocols	4 CR
M-INFO-101207	Networking Security - Theory and Praxis	9 CR
M-INFO-100796	Parallel Algorithms	5 CR
M-INFO-102072	Laboratory Course Algorithm Engineering	6 CR
M-INFO-101663	Practical Course: Analyzing Big Data	6 CR
M-INFO-102807	Practical Course: Analysis of Complex Data Sets	4 CR
M-INFO-103138	Lab Course: Natural Language Processing and Software Engineering	5 CR
M-INFO-101666	Practical Course: Geometric Modeling	3 CR
M-INFO-103302	Lab: Graph Visualization in Practice	5 CR
M-INFO-103128	Practical Course: Implementation and Evaluation of Advanced Data Mining Approaches for Semi-Structured Data	4 CR
M-INFO-103235	Practical Course: Smart Data Analytics	6 CR
M-INFO-100794	Randomized Algorithms	5 CR
M-INFO-100893	Robotics I - Introduction to Robotics	6 CR
M-INFO-101202	Software Methods	9 CR
M-INFO-101201	Software Systems	9 CR
M-INFO-100806	Language Technology and Compiler	8 CR
M-INFO-100801	Telematics	6 CR
M-INFO-100789	Ubiquitous Computing	5 CR
M-WIWI-101458	Ubiquitous Computing	9 CR
M-INFO-101864	Subdivision Algorithms	5 CR
M-WIWI-105368	Web and Data Science <small>neu</small>	9 CR
M-WIWI-101455	Web Data Management	9 CR
M-INFO-101203	Wireless Networking	8 CR
M-INFO-105328	Seminar: Computer Science TECO <small>neu</small>	3 CR
M-INFO-105252	Machine Learning - Basic Methods <small>neu</small>	3 CR

## 4.3 Economics and Management

Credits  
33

Mandatory		
M-WIWI-101443	Information Engineering and Management	10 CR
M-WIWI-103243	Optimization under Uncertainty in Information Engineering and Management	5 CR
Election block: Elective Modules in Economics and Management (9 credits)		
M-WIWI-101637	Analytics and Statistics	9 CR
M-WIWI-101453	Applied Strategic Decisions	9 CR
M-WIWI-101410	Business & Service Engineering	9 CR
M-WIWI-101504	Collective Decision Making	9 CR
M-WIWI-101498	Management Accounting	9 CR
M-WIWI-101510	Cross-Functional Management Accounting	9 CR
M-WIWI-101470	Data Science: Advanced CRM	9 CR
M-WIWI-103117	Data Science: Data-Driven Information Systems	9 CR
M-WIWI-103118	Data Science: Data-Driven User Modeling	9 CR
M-WIWI-101647	Data Science: Evidence-based Marketing	9 CR
M-WIWI-105032	Data Science for Finance	9 CR
M-WIWI-104080	Designing Interactive Information Systems	9 CR
M-WIWI-102808	Digital Service Systems in Industry	9 CR
M-WIWI-103720	eEnergy: Markets, Services and Systems	9 CR
M-WIWI-101409	Electronic Markets	9 CR
M-WIWI-101451	Energy Economics and Energy Markets	9 CR
M-WIWI-101452	Energy Economics and Technology	9 CR
M-WIWI-101488	Entrepreneurship (EnTechnon)	9 CR
M-WIWI-101505	Experimental Economics	9 CR
M-WIWI-101482	Finance 1	9 CR
M-WIWI-101483	Finance 2	9 CR
M-WIWI-101480	Finance 3	9 CR
M-WIWI-105036	FinTech Innovations	9 CR
M-WIWI-101471	Industrial Production II	9 CR
M-WIWI-101412	Industrial Production III	9 CR
M-WIWI-104068	Information Systems in Organizations	9 CR
M-WIWI-101478	Innovation and Growth	9 CR
M-WIWI-101507	Innovation Management	9 CR
M-WIWI-101514	Innovation Economics	9 CR
M-WIWI-101446	Market Engineering	9 CR
M-WIWI-105312	Marketing and Sales Management <sup>neu</sup>	9 CR
M-WIWI-101473	Mathematical Programming	9 CR
M-WIWI-101500	Microeconomic Theory	9 CR
M-WIWI-101406	Network Economics	9 CR
M-WIWI-101638	Econometrics and Statistics I	9 CR
M-WIWI-101639	Econometrics and Statistics II	9 CR
M-WIWI-101502	Economic Theory and its Application in Finance	9 CR
M-WIWI-102832	Operations Research in Supply Chain Management	9 CR
M-WIWI-101506	Service Analytics	9 CR
M-WIWI-101503	Service Design Thinking	9 CR
M-WIWI-101448	Service Management	9 CR
M-WIWI-102754	Service Economics and Management	9 CR
M-WIWI-102805	Service Operations	9 CR

M-WIWI-102806	Service Innovation, Design & Engineering	9 CR
M-WIWI-103289	Stochastic Optimization	9 CR
M-WIWI-103119	Advanced Topics in Strategy and Management	9 CR
M-WIWI-101468	Environmental Economics	9 CR
M-WIWI-101485	Transport Infrastructure Policy and Regional Development	9 CR
M-WIWI-101511	Advanced Topics in Public Finance	9 CR
M-WIWI-101496	Growth and Agglomeration	9 CR
<b>Election block: Elective Modules in Business Administration (9 credits)</b>		
M-WIWI-101410	Business & Service Engineering	9 CR
M-WIWI-101498	Management Accounting	9 CR
M-WIWI-101510	Cross-Functional Management Accounting	9 CR
M-WIWI-101470	Data Science: Advanced CRM	9 CR
M-WIWI-103117	Data Science: Data-Driven Information Systems	9 CR
M-WIWI-103118	Data Science: Data-Driven User Modeling	9 CR
M-WIWI-101647	Data Science: Evidence-based Marketing	9 CR
M-WIWI-105032	Data Science for Finance	9 CR
M-WIWI-104080	Designing Interactive Information Systems	9 CR
M-WIWI-102808	Digital Service Systems in Industry	9 CR
M-WIWI-103720	eEnergy: Markets, Services and Systems	9 CR
M-WIWI-101409	Electronic Markets	9 CR
M-WIWI-101451	Energy Economics and Energy Markets	9 CR
M-WIWI-101452	Energy Economics and Technology	9 CR
M-WIWI-101488	Entrepreneurship (EnTechnon)	9 CR
M-WIWI-101482	Finance 1	9 CR
M-WIWI-101483	Finance 2	9 CR
M-WIWI-101480	Finance 3	9 CR
M-WIWI-105036	FinTech Innovations	9 CR
M-WIWI-101471	Industrial Production II	9 CR
M-WIWI-101412	Industrial Production III	9 CR
M-WIWI-104068	Information Systems in Organizations	9 CR
M-WIWI-101507	Innovation Management	9 CR
M-WIWI-103247	Intelligent Risk and Investment Advisory	9 CR
M-WIWI-101446	Market Engineering	9 CR
M-WIWI-105312	Marketing and Sales Management <sup>neu</sup>	9 CR
M-WIWI-101506	Service Analytics	9 CR
M-WIWI-101503	Service Design Thinking	9 CR
M-WIWI-102754	Service Economics and Management	9 CR
M-WIWI-102806	Service Innovation, Design & Engineering	9 CR
M-WIWI-101448	Service Management	9 CR
M-WIWI-103119	Advanced Topics in Strategy and Management	9 CR

#### 4.4 Law

Credits  
18

<b>Election block: Law (18 credits)</b>		
M-INFO-101215	Intellectual Property Law	9 CR
M-INFO-101216	Private Business Law	9 CR
M-INFO-101217	Public Business Law	9 CR
M-INFO-101242	Governance, Risk & Compliance	9 CR

**4.5 Research Course****Credits**  
6

Election block: Research Courses Choose (2 out of 3 Modules) (2 items)		
M-INFO-101218	<a href="#">Seminar Module Law</a>	3 CR
M-INFO-102822	<a href="#">Seminar Module Informatics</a>	3 CR
M-WIWI-102736	<a href="#">Seminar Module Economic Sciences</a>	3 CR

## 5 Modules

### M

### 5.1 Module: Advanced Algorithms: Design and Analysis [M-INFO-101199]

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

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
2 semester

**Level**  
4

**Version**  
2

Election block: Design and Analysis / Engineering and Applications (at least 1 item as well as at least 9 credits)			
T-INFO-101334	<a href="#">Algorithms in Cellular Automata</a>	5 CR	Worsch
T-INFO-101331	<a href="#">Randomized Algorithms</a>	5 CR	Worsch
T-INFO-101333	<a href="#">Parallel Algorithms</a>	5 CR	Sanders
T-INFO-103334	<a href="#">Algorithmic Methods for Hard Optimization Problems</a>	5 CR	Wagner
T-INFO-104390	<a href="#">Algorithms for Visualization of Graphs</a>	5 CR	Wagner
T-INFO-104374	<a href="#">Laboratory Course Algorithm Engineering</a>	6 CR	Sanders, Wagner
T-INFO-101332	<a href="#">Algorithm Engineering</a>	5 CR	Sanders, Wagner
T-INFO-100002	<a href="#">Algorithms for Routing</a>	5 CR	Wagner

#### Competence Goal

The student

- knows advanced methodical approaches with respect to the design and analysis of algorithms,
- can comment on theoretical aspects of algorithmics in a qualified and well-structured manner,
- identifies algorithmic problems from different areas and can formulate these formally,
- can analyze and judge the computational complexity of algorithmic problems from different areas,
- can recognize and design suitable algorithmic techniques to solve algorithmic problems.

#### Content

This module conveys profound knowledge concerning theoretical aspects of algorithmics. Its focus is on the design and analysis of advanced algorithms, particularly, on algorithms for graphs, randomized algorithms, parallel algorithms and algorithms for NP-hard problems.

#### Workload

approx. 270h

## M

## 5.2 Module: Advanced Algorithms: Engineering and Applications [M-INFO-101200]

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

Credits	Recurrence	Duration	Level	Version
9	Each term	2 semester	4	2

Election block: Engineering and Applications / Design and Analysis (at least 1 item as well as at least 9 credits)			
T-INFO-100002	<a href="#">Algorithms for Routing</a>	5 CR	Wagner
T-INFO-101332	<a href="#">Algorithm Engineering</a>	5 CR	Sanders, Wagner
T-INFO-101333	<a href="#">Parallel Algorithms</a>	5 CR	Sanders
T-INFO-103334	<a href="#">Algorithmic Methods for Hard Optimization Problems</a>	5 CR	Wagner
T-INFO-104374	<a href="#">Laboratory Course Algorithm Engineering</a>	6 CR	Sanders, Wagner
T-INFO-104390	<a href="#">Algorithms for Visualization of Graphs</a>	5 CR	Wagner
T-INFO-101331	<a href="#">Randomized Algorithms</a>	5 CR	Worsch

**Competence Goal**

The Student

- knows advanced methodical approaches concerning the design of algorithms and their applications,
- can comment on the practical aspects of algorithmics in a qualified and well-structured manner,
- identifies algorithmic problems from different areas of application and can formulate these formally,
- can judge the computational complexity of algorithmic problems,
- recognizes suitable algorithmic techniques for solving these problems and can transfer and apply knowledge of these techniques to new problems,
- can implement solutions based on algorithmic techniques for practical problems and can evaluate these

**Prerequisites**

None

**Content**

This module conveys profound knowledge concerning practical aspects of algorithmics and covers applications of algorithms for practical problems. Its focus is on the design, the practical implementation and the evaluation of algorithms, particularly, algorithms for graphs, parallel algorithms, algorithms for NP-hard problems, optimization algorithms inspired by nature, as well as algorithms from various areas of application.

**Workload**

270h

## M

## 5.3 Module: Advanced Topics in Cryptography [M-INFO-101198]

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

Credits	Recurrence	Duration	Level	Version
9	Each term	1 semester	4	1

Election block: Advanced Topics in Cryptography (at least 1 item as well as at least 9 credits)			
T-INFO-101373	Selected Topics in Cryptography	3 CR	Müller-Quade
T-INFO-101260	Asymmetric Encryption Schemes	3 CR	Müller-Quade
T-INFO-101259	Provable Security in Cryptography	3 CR	Hofheinz
T-INFO-101280	Digital Signatures	3 CR	Hofheinz
T-INFO-101279	Cryptographic Voting Schemes	3 CR	Müller-Quade
T-INFO-101360	Signals and Codes	3 CR	Müller-Quade
T-INFO-101390	Symmetric Encryption	3 CR	Müller-Quade

**Competence Goal**

The student

- will be familiar with the theoretical foundations and the basic mechanisms of computer security and cryptography.
- can understand and explain the methods of computer security and cryptography,
- will be able to read and understand the latest scientific papers,
- will be able to critically assess appropriate security solutions, and identify weaknesses / threats,
- can design an own security solution to a given problem, (eg. later in the a master's thesis).

**Prerequisites**

None

**Content**

The module is intended to provide depth theoretical and practical aspects of IT security and cryptography.

- Development of safety goals and classification of threats.
- Formal description of authentication systems.
- Analysis of typical vulnerabilities in programs and web applications and development of appropriate protective methods / avoidance strategies
- Overview of opportunities for side channel attacks
- Introduction to key management and Public Key Infrastructure
- Presentation and comparison of current safety certifications.
- The current research issues from some of the following areas are covered:
  - Block ciphers, hash functions,
  - Public-key encryption, digital signature, key exchange.
  - Basic security protocols such as fair coin toss over the phone, Byzantine Agreement, Dutch Flower Auctions, Zero Knowledge.
  - Threat models and security definitions.
  - Modular design and protocol composition.
  - Security definitions of simulatability.
  - Universal Composability.
  - Deniability as an additional safety feature.
  - Electronic Voting.

## M

## 5.4 Module: Advanced Topics in Public Finance [M-WIWI-101511]

**Responsible:** Prof. Dr. Berthold Wigger

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	German	4	4

Mandatory			
T-WIWI-102740	<a href="#">Public Management</a>	4,5 CR	Wigger
Election block: Supplementary Courses (between 4,5 and 5 credits)			
T-WIWI-108880	<a href="#">Blockchains &amp; Cryptofinance</a>	4,5 CR	Schuster, Uhrig-Homburg
T-WIWI-108711	<a href="#">Basics of German Company Tax Law and Tax Planning</a>	4,5 CR	Gutekunst, Wigger
T-WIWI-102739	<a href="#">Public Revenues</a>	4,5 CR	Wigger

### 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

- understands the theory and politics of taxation
- has knowledge in the area of public debt.
- understands efficiency problems of public organizations.
- is able to work on fiscal problems.

### Prerequisites

The course "Public Management" is compulsory and must be examined.

### 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.

In the course of the lectures within this module the students achieve knowledge in the areas of public revenues, national and international law of taxation and theory of public sector organizations.

### Recommendation

Basic knowledge in the area of public finance and public management is required.

### Annotation

The course T-WIWI-102790 "Specific Aspects in Taxation" will no longer be offered in the module as of winter semester 2018/2019.

Students who successfully passed the exam in „Public Management“ before the introduction of the module “Advanced Topics in Public Finance” in winter term 2014/15 are allowed to take both courses “Public Revenues” and “Specific Aspects in Taxation”.

### Workload

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



## M

## 5.5 Module: Advanced Topics in Strategy and Management [M-WIWI-103119]

**Responsible:** Prof. Dr. Hagen Lindstädt

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
1

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-106188	<a href="#">Workshop Current Topics in Strategy and Management</a>	3 CR	Lindstädt
T-WIWI-106189	<a href="#">Workshop Business Wargaming – Analyzing Strategic Interactions</a>	3 CR	Lindstädt
T-WIWI-106190	<a href="#">Strategy and Management Theory: Developments and “Classics”</a>	3 CR	Lindstädt

### 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

Students

- are able to analyze business strategies and derive recommendations using appropriate frameworks
- learn to express their position through compelling reasoning in structured discussions
- are qualified to critically examine recent research topics in the field of strategic management
- can derive own conclusions from less structured information by using interdisciplinary knowledge

### Prerequisites

None

### Content

The module is divided into three main topics:

The students

- analyze and discuss a wide range of business strategies on the basis of collectively selected case studies.
- participate in a business wargaming workshop and analyze strategic interactions.
- write a paper about current topics in the field of strategic management theory.

### Recommendation

None

### Annotation

This course is admission restricted. After being admitted to one course of this module, the participation at the other courses will be guaranteed.

Every course of this module will be at least offered every second term. Thus, it will be possible to complete the module within two terms.

## M

## 5.6 Module: Algorithm Engineering [M-INFO-100795]

**Responsible:** Prof. Dr. Peter Sanders  
 Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** [Informatics](#)

Credits	Recurrence	Duration	Language	Level	Version
5	Each summer term	1 term	German	4	1

Mandatory			
T-INFO-101332	<a href="#">Algorithm Engineering</a>	5 CR	Sanders, Wagner

## M

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

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

Credits	Recurrence	Duration	Language	Level	Version
5	Irregular	1 semester	German	4	1

Mandatory			
T-INFO-103334	<a href="#">Algorithmic Methods for Hard Optimization Problems</a>	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 reasonable 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 nevertheless ("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

## 5.8 Module: Algorithmic Methods for Network Analysis [M-INFO-102400]

**Responsible:** Dr. rer. nat. Torsten Ueckerdt  
Prof. Dr. Dorothea Wagner

**Organisation:** KIT Department of Informatics

**Part of:** [Informatics](#)

**Credits**  
5

**Recurrence**  
Irregular

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-104759	<a href="#">Algorithmic Methods for Network Analysis</a>	5 CR	Ueckerdt, Wagner

**Workload**  
150 h

M

## 5.9 Module: Algorithms for Routing [M-INFO-100031]

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

Credits	Recurrence	Duration	Language	Level	Version
5	Each summer term	1 term	German	4	1

Mandatory			
T-INFO-100002	Algorithms for Routing	5 CR	Wagner

M

## 5.10 Module: Algorithms for Visualization of Graphs [M-INFO-102094]

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

Credits	Recurrence	Language	Level	Version
5	Irregular	German	4	1

Mandatory			
T-INFO-104390	Algorithms for Visualization of Graphs	5 CR	Wagner

## M

## 5.11 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:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
6	Each winter term	1 semester	German	4	1

Mandatory			
T-INFO-102020	Algorithms II	6 CR	Prautzsch, Sanders, Wagner

M

## 5.12 Module: Algorithms in Cellular Automata [M-INFO-100797]

**Responsible:** Thomas Worsch  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
5	Each summer term	1 term	German	4	1

Mandatory			
T-INFO-101334	<a href="#">Algorithms in Cellular Automata</a>	5 CR	Worsch



## M

## 5.13 Module: Analytics and Statistics [M-WIWI-101637]

**Responsible:** Prof. Dr. Oliver Grothe

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
2

Mandatory			
T-WIWI-103123	<a href="#">Advanced Statistics</a>	4,5 CR	Grothe
Election block: Supplementary Courses (between 4,5 and 5 credits)			
T-WIWI-106341	<a href="#">Machine Learning 2 - Advanced Methods</a>	4,5 CR	Zöllner
T-WIWI-103124	<a href="#">Multivariate Statistical Methods</a>	4,5 CR	Grothe

### 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 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

A Student

- Deepens the knowledge of descriptive and inferential statistics.
- Deals with simulation methods.
- Learns basic and advanced methods of statistical analysis of multivariate and high-dimensional data.

### Prerequisites

The course "*Advanced Statistics*" is compulsory.

### Content

- Deriving estimates and testing hypotheses
- Stochastic processes
- Multivariate statistics, copulas
- Dependence measures
- Dimension reduction
- High-dimensional methods
- Prediction

### Annotation

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

### Workload

The total workload for this module is approximately 270 hours.

## M

## 5.14 Module: Applied Strategic Decisions [M-WIWI-101453]

**Responsible:** Prof. Dr. Johannes Philipp Reiß  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

Credits	Recurrence	Language	Level	Version
9	Each term	German/English	4	4

Mandatory			
T-WIWI-102861	<a href="#">Advanced Game Theory</a>	4,5 CR	Ehrhart, Puppe, Reiß
Election block: Supplementary Courses (between 45 and 5 credits)			
T-WIWI-102613	<a href="#">Auction Theory</a>	4,5 CR	Ehrhart
T-WIWI-102614	<a href="#">Experimental Economics</a>	4,5 CR	Weinhardt
T-WIWI-102622	<a href="#">Corporate Financial Policy</a>	4,5 CR	Ruckes
T-WIWI-102623	<a href="#">Financial Intermediation</a>	4,5 CR	Ruckes
T-WIWI-102640	<a href="#">Market Engineering: Information in Institutions</a>	4,5 CR	Weinhardt
T-WIWI-102862	<a href="#">Predictive Mechanism and Market Design</a>	4,5 CR	Reiß
T-WIWI-105781	<a href="#">Incentives in Organizations</a>	4,5 CR	Nieken

**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**

Students

- can model and analyze complex situations of strategic interaction using advanced game theoretic concepts;
- are provided with essential and advanced game theoretic solution concepts on a rigorous level and can apply them to understand real-life problems;
- learn about the experimental method, ranging from designing an economic experiment to data analysis.

**Prerequisites**

The course "Advanced Game Theory" is obligatory. Exception: The course "Introduction to Game Theory" was completed.

**Content**

The module provides solid skills in game theory and offers a broad range of game theoretic applications. To improve the understanding of theoretical concepts, it pays attention to empirical evidence as well.

**Recommendation**

Basic knowledge in game theory is assumed.

**Annotation**

The course *Predictive Mechanism and Market Design* is not offered each year.

**Workload**

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

## M

## 5.15 Module: Artificial Intelligence [M-WIWI-105366]

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	4	1

Election block: Compulsory Elective Courses (at least 2 items)			
T-WIWI-102666	Knowledge Discovery	4,5 CR	Sure-Vetter
T-WIWI-110848	Semantic Web Technologies	4,5 CR	Sure-Vetter
T-WIWI-110548	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**

The student

- understands the concepts behind Semantic Web and Linked Data technologies
- develops ontologies to be employed in semantic web-based applications and chooses suitable representation languages,
- is familiar with approaches in the area of knowledge representation and modelling,
- is able to transfer the methods and technologies of semantic web technologies to new application sectors,
- evaluates the potential of semantic web for new application sectors,
- understands the challenges in the areas of Data and system integration on the web is able to develop solutions.
- know the basics of machine learning, data mining and knowledge discovery
- can design, train and evaluate systems that are capable of learning
- carry out knowledge discovery projects, taking into account algorithms, representations and applications.

**Prerequisites**

None

**Content**

The focus of the module is on Semantic Web Technologies as well as machine learning and data mining methods for knowledge acquisition from large databases.

The goal of the semantic web is the meaning (semantics) of data on the web for intelligent systems, e.g. in e-commerce and to make Internet portals usable. The representation of knowledge in the form of RDF and ontologies, the provision of data as Linked Data, as well as the request of data using SPARQL. In this lecture the basics of knowledge representation and processing for the corresponding technologies and application examples are presented.

The lecture "Knowledge Discovery" gives an overview of approaches of machine learning and data mining for knowledge extraction from large data sets. These are examined especially with regard to algorithms, applicability to different data representations and the use in real application scenarios.

Knowledge Discovery is an established research area with a large community that investigates methods for discovering patterns and regularities in large amounts of data, including unstructured text. A variety of methods exist to extract patterns and provide previously unknown insights. This information can be predictive or descriptive.

The lecture gives an overview of Knowledge Discovery. Specific techniques and methods, challenges and current and future research topics in this research area will be taught.

Contents of the lecture cover the entire machine learning and data mining process with topics on supervised and unsupervised learning and empirical evaluation. Covered learning methods range from classical approaches like decision trees, support vector machines and neural networks to selected approaches from current research. Learning problems considered include feature vector-based learning and text mining.

**Workload**

The total workload for this module is approximately 270 hours.

M

## 5.16 Module: Automated Planning and Scheduling [M-INFO-104447]

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

Credits	Recurrence	Language	Level	Version
5	Each winter term	English	4	1

Mandatory			
T-INFO-109085	<a href="#">Automated Planning and Scheduling</a>	5 CR	Sanders

M

## 5.17 Module: Automated Visual Inspection and Image Processing [M-INFO-100826]

**Responsible:** Prof. Dr.-Ing. Jürgen Beyerer  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
6	Each winter term	1 term	German	4	1

Mandatory			
T-INFO-101363	<a href="#">Automated Visual Inspection and Image Processing</a>	6 CR	Beyerer

## M

## 5.18 Module: Autonomous Robotics [M-INFO-101251]

**Responsible:** Prof. Dr.-Ing. Rüdiger Dillmann  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Level	Version
9	Once	2 semester	4	3

Election block: Autonomous Robotics (at least 1 item as well as at least 9 credits)			
T-INFO-101351	<a href="#">Biologically Inspired Robots</a>	3 CR	Dillmann, Rönnau
T-INFO-109931	<a href="#">Robotics III - Sensors and Perception in Robotics</a>	3 CR	Asfour
T-INFO-105723	<a href="#">Robotics II: Humanoid Robotics</a>	3 CR	Asfour

**Prerequisites**  
None

M

## 5.19 Module: Big Data Analytics [M-INFO-100768]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
5	Each winter term	1 term	German	4	1

Mandatory			
T-INFO-101305	Big Data Analytics	5 CR	Böhm

M

## 5.20 Module: Big Data Analytics 2 [M-INFO-102773]

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

Credits	Recurrence	Language	Level	Version
3	Irregular	German	4	1

Mandatory			
T-INFO-105742	<a href="#">Big Data Analytics 2</a>	3 CR	Böhm



## M

**5.21 Module: Business & Service Engineering [M-WIWI-101410]****Responsible:** Prof. Dr. Christof Weinhardt**Organisation:** KIT Department of Economics and Management**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

<b>Credits</b> 9	<b>Recurrence</b> Each term	<b>Language</b> German/English	<b>Level</b> 4	<b>Version</b> 4
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Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-106201	<a href="#">Digital Transformation of Organizations</a>	4,5 CR	Mädche
T-WIWI-102639	<a href="#">Business Models in the Internet: Planning and Implementation</a>	4,5 CR	Weinhardt
T-WIWI-102848	<a href="#">Personalization and Services</a>	4,5 CR	Sonnenbichler
T-WIWI-110887	<a href="#">Practical Seminar: Service Innovation</a>	4,5 CR	Satzger
T-WIWI-102847	<a href="#">Recommender Systems</a>	4,5 CR	Geyer-Schulz
T-WIWI-102641	<a href="#">Service Innovation</a>	4,5 CR	Satzger
T-WIWI-109940	<a href="#">Special Topics in Information Systems</a>	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 student should

- learn to develop and implement new markets with regards to the technological progresses of information and communication technology and the increasing economic networking
- learn to restructure and develop new business processes in markets under those conditions
- understand service competition as a sustainable competitive strategy and understand the effects of service competition on the design of markets, products, processes and services.
- improve his statistics skills and apply them to appropriate cases
- learn to elaborate solutions in a team

**Prerequisites**

None

**Content**

This module addresses the challenges of creating new kinds of products, processes, services, and markets from a service perspective in the context of new developed information and communication technologies and the globalization process. The module describes service competition as a business strategy in the long term that leads to the design of business processes, business models, forms of organization, markets, and competition. This will be shown by actual examples from personalized services, recommender services and social networks.

**Recommendation**

None

**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](http://www.iism.kit.edu/im/lehre).

**Workload**

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

## M

## 5.22 Module: Cognitive Systems [M-INFO-100819]

**Responsible:** Prof. Dr. Gerhard Neumann  
Prof. Dr. Alexander Waibel

**Organisation:** KIT Department of Informatics

**Part of:** [Informatics](#)

Credits	Recurrence	Duration	Language	Level	Version
6	Each summer term	1 term	German	4	1

Mandatory			
T-INFO-101356	<a href="#">Cognitive Systems</a>	6 CR	Neumann, Waibel

## M

## 5.23 Module: Collective Decision Making [M-WIWI-101504]

**Responsible:** Prof. Dr. Clemens Puppe

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	English	4	4

Election block: Compulsory Elective Courses ()			
T-WIWI-102740	<a href="#">Public Management</a>	4,5 CR	Wigger
T-WIWI-102859	<a href="#">Social Choice Theory</a>	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 separately.

The overall grade of the 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 able to model practical problems of the public sector and to analyze them with respect to positive and normative questions,
- understand individual incentives and social outcomes of different institutional designs,
- are familiar with the functioning and design of democratic elections and can analyze them with respect to their individual incentives.

### Prerequisites

None

### Content

The focus of the module is on mechanisms of public decisions making, including voting and the aggregation of preferences and judgements.

### Workload

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

## M

## 5.24 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:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
8	Each summer term	1 semester	German	4	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

## 5.25 Module: Computational Complexity Theory, with a View Towards Cryptography [M-INFO-101575]

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

**Credits**  
6

**Recurrence**  
Irregular

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-103014	<a href="#">Computational Complexity Theory, with a View Towards Cryptography</a>	6 CR	Hofheinz, Müller-Quade

M

## 5.26 Module: Computational Geometry [M-INFO-102110]

**Responsible:** Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** [Informatics](#)

Credits	Recurrence	Language	Level	Version
5	Irregular	German	4	1

Mandatory			
T-INFO-104429	<a href="#">Computational Geometry</a>	5 CR	Wagner

M

## 5.27 Module: Context Sensitive Systems [M-INFO-100728]

**Responsible:** Prof. Dr.-Ing. Michael Beigl  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Language	Level	Version
5	Each summer term	German	4	2

Mandatory			
T-INFO-107499	<a href="#">Context Sensitive Systems</a>	5 CR	Beigl

## M

## 5.28 Module: Critical Digital Infrastructures [M-WIWI-104403]

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	4	2

Mandatory			
T-WIWI-109248	Critical Information Infrastructures	4,5 CR	Sunyaev
Election block: Compulsory Elective Courses (at least 9 credits)			
T-WIWI-109246	Digital Health	4,5 CR	Sunyaev
T-WIWI-110144	Emerging Trends in Digital Health	4,5 CR	Sunyaev
T-WIWI-110143	Emerging Trends in Internet Technologies	4,5 CR	Sunyaev
T-WIWI-109249	Sociotechnical Information Systems Development	4,5 CR	Sunyaev
T-WIWI-109251	Selected Issues in Critical Information Infrastructures	4,5 CR	Sunyaev

**Competence Certificate**

The assessment is carried out as partial exams according to § 4 paragraph 2 Nr. 1 – Nr. 3 SPO of the examination regulation of the core course and further single courses of this module, whose sum of credits must meet 9 credits.

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 students ...

- have foundational knowledge about the design and operation of critical digital infrastructures
- have in-depth methodological knowledge in design science research and related scientific domains
- can distinguish between the challenges and opportunities of critical digital infrastructures in different domains
- can evaluate and improve sociotechnical systems
- combine theoretical and practical contents of the courses in the module to solve existing problems in the domain of critical digital infrastructures

**Prerequisites**

None

**Content**

Critical digital infrastructures are sociotechnical systems comprising essential software components and information systems with pivotal impact on individuals, organizations, governments, economies, and society. Critical information infrastructures require careful design, development, and evaluation to ensure reliable, secure, and purposeful operation. This module features a strong focus on different subject areas, including, but not limited to, internet technologies, health care, and information privacy. The lectures in the module introduce students to a domain relevant to critical digital infrastructures and the labs allow to gain hands-on experience in this interesting domain.

**Recommendation**

The courses in the module may be held in English. Participants should be well versed in written and spoken English.

The courses can be visited independently. Participants can start the module in the winter as well as in the summer term.

Programming skills may be required in some courses.

Experience in writing scientific papers is helpful but not required.

**Annotation**

This new module can be chosen from summer term 2018.

**Workload**

30 hours per ECTS

Total workload for 9 ECTS: approx. 270 hours

The exact allocation is made according to the credit points of the courses.



## M

## 5.29 Module: Cross-Functional Management Accounting [M-WIWI-101510]

**Responsible:** Prof. Dr. Marcus Wouters

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

Credits	Recurrence	Language	Level	Version
9	Each term	German/English	4	8

Mandatory			
T-WIWI-102885	<a href="#">Advanced Management Accounting</a>	4,5 CR	Wouters
Election block: Supplementary Courses (4,5 credits)			
T-WIWI-110179	<a href="#">Advanced Management Accounting 2</a>	4,5 CR	Wouters
T-WIWI-105777	<a href="#">Business Intelligence Systems</a>	4,5 CR	Mädche, Nadj, Toreini
T-WIWI-105781	<a href="#">Incentives in Organizations</a>	4,5 CR	Nieken
T-WIWI-102835	<a href="#">Marketing Strategy Business Game</a>	1,5 CR	Klarmann
T-WIWI-107720	<a href="#">Market Research</a>	4,5 CR	Klarmann
T-WIWI-102883	<a href="#">Pricing</a>	4,5 CR	Feurer
T-WIWI-109864	<a href="#">Product and Innovation Management</a>	3 CR	Klarmann
T-WIWI-102621	<a href="#">Valuation</a>	4,5 CR	Ruckes
T-WIWI-108651	<a href="#">Extraordinary additional course in the module Cross-Functional Management Accounting</a>	4,5 CR	Wouters

### 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

Students will be able to apply advanced management accounting methods to managerial decision-making problems in marketing, finance, organization and strategy.

### Prerequisites

The course "Advanced Management Accounting" is compulsory.

The additional courses can only be chosen after the compulsory course has been completed successfully.

### Content

The module includes a course on several advanced management accounting methods that can be used for various decisions in operations and innovation management. By selecting another course, each student looks in more detail at one interface between management accounting a particular field in management, namely marketing, finance, or organization and strategy.

### Recommendation

None

### Annotation

The module "Cross-functional Management Accounting" always includes the compulsory course "Advanced Management Accounting." Students look at the interface between management accounting and another field in management. Students build the module by adding a course from the specified list. Students can also suggest another suitable course for this module for evaluation by the coordinator.

### Workload

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

## M

## 5.30 Module: Data Privacy: From Anonymization to Access Control [M-INFO-104045]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Language	Level	Version
3	Irregular	German	4	1

Mandatory			
T-INFO-108377	Data Privacy: From Anonymization to Access Control	3 CR	Böhm

## M

## 5.31 Module: Data Science for Finance [M-WIWI-105032]

**Responsible:** Prof. Dr Maxim Ulrich

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

Credits	Recurrence	Language	Level	Version
9	Each winter term	English	4	1

Mandatory			
T-WIWI-102878	<a href="#">Computational Risk and Asset Management</a>	6 CR	Ulrich
T-WIWI-110213	<a href="#">Python for Computational Risk and Asset Management</a>	3 CR	Ulrich

### Competence Certificate

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

The assessment of "Computational Risk and Asset Management" is carried out in form of a written exam (90 minutes), the assessment of "Python for Computational Risk and Asset Management" is carried out in form of twelve weekly Python programming tasks and offered each winter term.

The overall grade of the module is the grade of the written exam weighted with factor 0.75 and the grade for the Python programming tasks weighted with factor 0.25. The resulting grade is truncated after the first decimal.

### Competence Goal

Students learn how to implement solutions for advanced and real-world challenges in portfolio management. The focus of this module is on the realization of statistical concepts in Python and enable students to solve a broad range of problems along the investment process on their own.

### Content

The module covers several topics, among them:

- Quantitative Portfolio Strategies: Extensions to Mean-Variance Portfolio Optimization
- Return Densities: Forecasting with Traditional and Machine Learning Approaches, Monte Carlo Simulation
- Financial Economics: Rationalizing Risk Premiums via Stochastic Discount Factor
- Multi-Asset Valuation: DCF Approach, No-Arbitrage and Ito Calculus

### Recommendation

Good knowledge of statistics and first programming experience with Python is recommended.

### Workload

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

## M

## 5.32 Module: Data Science: Advanced CRM [M-WIWI-101470]

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

Credits  
9Recurrence  
Each termLanguage  
GermanLevel  
4Version  
5

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-109921	<a href="#">Advanced Machine Learning</a>	4,5 CR	Geyer-Schulz, Nazemi
T-WIWI-102762	<a href="#">Business Dynamics</a>	4,5 CR	Geyer-Schulz
T-WIWI-110915	<a href="#">Intelligent Agents and Decision Theory</a>	4,5 CR	Geyer-Schulz
T-WIWI-103549	<a href="#">Intelligent CRM Architectures</a>	4,5 CR	Geyer-Schulz
T-WIWI-102848	<a href="#">Personalization and Services</a>	4,5 CR	Sonnenbichler
T-WIWI-102847	<a href="#">Recommender Systems</a>	4,5 CR	Geyer-Schulz
T-WIWI-105778	<a href="#">Service Analytics A</a>	4,5 CR	Fromm

**Competence Certificate**

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

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

**Competence Goal**

The student

- understand service competition as a sustainable competitive strategy and understand the effects of service competition on the design of markets, products, processes and services,
- models, analyzes and optimizes the structure and dynamics of complex business applications,
- develops and realizes personalized services, especially in the field of recommendation services,
- analyzes social networks and knows their application field in CRM,
- works in teams.

**Prerequisites**

None

**Content**

Building on the basics of CRM from the Bachelor's degree program, the module "Data Science: Advanced CRM" is focusing on the use of information technology and its related economic issues in the CRM environment. The course "Intelligent CRM Architectures" deals with the design of modern intelligent systems. The focus is on the software architecture and design patterns that are relevant to learning systems. It also covers important aspects of machine learning that complete the picture of an intelligent system. Examples of presented systems are "Taste Map"-architectures, "Counting Services", as well as architectures of "Business Games". The impact of management decisions in complex systems are considered in the course "Business dynamics". The understanding, modeling and simulation of complex systems allows the analysis, the goal-oriented design and the optimization of markets, business processes and regulations throughout the company. Specific problems of intelligent systems are covered in the courses "Personalization and Services", "Recommender Systems", "Service Analytics" and "Social Network Analysis in CRM". The content includes procedures and methods to create user-oriented services. The measurement and monitoring of service systems, the design of personalized offers, and the generation of recommendations based on the collected data of products and customers are discussed. The importance of user modeling and -recognition, data security and privacy are addressed as well.

**Recommendation**

None

**Annotation**

The module has been renamed to "Data Science: Advanced CRM" in winter term 2016/2017.

**Workload**

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

## M

## 5.33 Module: Data Science: Data-Driven Information Systems [M-WIWI-103117]

**Responsible:** Prof. Dr. Alexander Mädche  
Prof. Dr. Christof Weinhardt

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

<b>Credits</b> 9	<b>Recurrence</b> Each term	<b>Language</b> German/English	<b>Level</b> 4	<b>Version</b> 7
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Election block: Compulsory Elective Courses ()			
T-WIWI-108715	<a href="#">Artificial Intelligence in Service Systems</a>	4,5 CR	Satzger
T-WIWI-109863	<a href="#">Business Data Analytics: Application and Tools</a>	4,5 CR	Weinhardt
T-WIWI-106187	<a href="#">Business Data Strategy</a>	4,5 CR	Weinhardt
T-WIWI-105777	<a href="#">Business Intelligence Systems</a>	4,5 CR	Mädche, Nadj, Toreini
T-WIWI-110918	<a href="#">Introduction to Bayesian Statistics for Analyzing Data</a>	3 CR	Scheibehenne
T-WIWI-106207	<a href="#">Practical Seminar: Data-Driven Information Systems</a>	4,5 CR	Mädche, Satzger, Setzer, Weinhardt

#### 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.

#### Competence Goal

The student

- understands the strategic role of integrating, transforming, and analyzing large and complex enterprise data in modern business information systems and is capable of comparing and assessing strategic alternatives
- has the core skills to design, model, and control complex, inter-organisational analytical, processes, including various business functions as well as customers and markets
- understands the usage of performance indicators for a variety of controlling and management issues and is able to define models for generating the relevant performance indicators under considerations of data availability
- distinguishes different analytics methods and concepts and learn when to apply to better understand and anticipate business relationships and developments of industrial and in particular service companies to derive fact- and data- founded managerial actions and strategies.
- knows how to capture uncertainty in the data and how to appropriately consider and visualize uncertainty in decision support or business intelligence systems and analytical processes as a whole.

#### Prerequisites

None.

**Content**

The amount of business-related data available in modern enterprise information systems grows exponentially, and the various data sources are more and more integrated, transformed, and analyzed jointly to gain valuable business insights, pro-actively control and manage business processes, to leverage planning and decision making, and to provide appropriate, potentially novel services to customers based on relationships and developments observed in the data.

Also, data sources are more and more connected and single business unit that used to operate on separate data pools are now becoming highly integrated, providing tremendous business opportunities but also challenges regarding how the data should be represented, integrated, preprocessed, transformed, and finally used in analytics planning and decision processes.

The courses of this module equip the students with core skills to understand the strategic role of integrating, transforming, and analyzing large and complex enterprise data in modern business information systems. Students will be capable to designing, comparing, and evaluating strategic alternatives. Also, students will learn how to design, model, and control complex analytical processes, including various business functions of industrial and service companies including customers and markets. Students learn core skills to understand fundamental strategies for integrating analytic models and operative controlling mechanisms while ensuring the technical feasibility of the resulting information systems..

Furthermore, the student can distinguish different methods and concepts in the realm of data science and learns when to apply. She/he will know the means of characterizing and analyzing heterogeneous, high-dimensional data available data in data warehouses and external data sources to gain additional insights valuable for enterprise planning and decision making. Also, the students know how to capture uncertainty in the data and how to appropriately consider and visualize uncertainty in business information and business intelligence systems.

The module offers the opportunity to apply and deepen this knowledge in a seminar and hands-on tutorials that are offered with all lectures.

Texteintrag

**Recommendation**

Basic knowledge of Information Management, Operations Research, Descriptive Statistics, and Inferential Statistics is assumed.

**Annotation**

The course „Business Data Strategy“ can be chosen from winter term 2016 on.

## M

## 5.34 Module: Data Science: Data-Driven User Modeling [M-WIWI-103118]

**Responsible:** Prof. Dr. Christof Weinhardt

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German/English

**Level**  
4

**Version**  
4

Election block: Compulsory Elective Courses (at least 9 credits)			
T-WIWI-109863	<a href="#">Business Data Analytics: Application and Tools</a>	4,5 CR	Weinhardt
T-WIWI-102614	<a href="#">Experimental Economics</a>	4,5 CR	Weinhardt
T-WIWI-102899	<a href="#">Modeling and Analyzing Consumer Behavior with R</a>	4,5 CR	Dorner, Weinhardt
T-WIWI-108765	<a href="#">Practical Seminar: Advanced Analytics</a>	4,5 CR	Weinhardt

### Competence Certificate

The assessment is carried out as partial exams 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.

### Competence Goal

Students of this module

- learn methods for planning empirical studies, in particular laboratory experiments,
- acquire theoretical knowledge and practical skills in analysing empirical data,
- familiarize with different ways of modelling user behaviour, are able to critically discuss, and to evaluate them

### Prerequisites

None

### Content

Understanding and supporting user interactions with applications better plays an increasingly large role in the design of business applications. This applies both to interfaces for customers and to internal information systems. The data that is generated during user interactions can be channelled straight into business processes, for instance by analysing and decomposing purchase decisions, and by feeding this data into product design processes.

The Crowd Analytics section considers the analysis of data from online platforms, particularly of those following crowd- or peer-to-peer based business models. This includes platforms like Airbnb, Kickstarter and Amazon Mechanical Turk.

Theoretical models of user (decision) behaviour help analyzing the empirically observed user behaviour in a systematic fashion. Testing these models and their predictions in controlled experiments (primarily in the lab) in turn helps refine theory and to generate practically relevant design recommendations. Analyses are carried out using advanced analytic methods.

Students learn fundamental theoretical models for user behaviour in systems and apply them to cases. Students are also taught methods and skills for conceptualizing and planning empirical studies and for analyzing the resulting data.

### Recommendation

Basic knowledge of Information Management, Operations Research, Descriptive Statistics, and Inferential Statistics is assumed.



## M

## 5.35 Module: Data Science: Evidence-based Marketing [M-WIWI-101647]

**Responsible:** Prof. Dr. Martin Klarmann

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
5

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-103139	<a href="#">Marketing Analytics</a>	4,5 CR	Klarmann
T-WIWI-107720	<a href="#">Market Research</a>	4,5 CR	Klarmann

### 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

- possess advanced knowledge of relevant market research contents
- know many different qualitative and quantitative methods for measuring customer behavior, preparation of strategic decisions, making causal deductions, usage of social media data and sales forecasting
- possess the statistical skills required for working in marketing research

### Prerequisites

Keine.

### Content

This module provides in-depth knowledge of relevant quantitative and qualitative methods used in market research.

Students can attend the following courses:

- The course "**Market Research**" provides contents of practical relevance for measuring customer attitudes and customer behavior. The participants learn using statistical methods for strategic decision-making in marketing. Students who are interested in writing their master thesis at the Marketing & Sales Research Group are required to take this course.
- The course „**Marketing Analytics**“ is based on „Market Research“ and teaches advanced statistical methods for analyzing relevant marketing and market research questions.

### Recommendation

None

### Workload

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

M

## 5.36 Module: Datamanagement in the Cloud [M-INFO-100769]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
5	Irregular	1 term	German	4	1

Mandatory			
T-INFO-101306	Datamanagement in the Cloud	5 CR	Böhm

M

## 5.37 Module: Deep Learning and Neural Networks [M-INFO-104460]

**Responsible:** Prof. Dr. Alexander Waibel  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Language	Level	Version
6	Each summer term	German	4	1

Mandatory			
T-INFO-109124	Deep Learning and Neural Networks	6 CR	Waibel

M

## 5.38 Module: Deployment of Database Systems [M-INFO-100780]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
5	Each winter term	1 term	German	4	1

Mandatory			
T-INFO-101317	Deployment of Database Systems	5 CR	Böhm

## M

## 5.39 Module: Designing Interactive Information Systems [M-WIWI-104080]

**Responsible:** Prof. Dr. Alexander Mädche

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

Credits	Recurrence	Language	Level	Version
9	Each term	German/English	4	2

Mandatory			
T-WIWI-110851	<a href="#">Designing Interactive Systems</a>	4,5 CR	Mädche, Morana
Election block: Supplementary Courses (at most 4,5 credits)			
T-WIWI-110877	<a href="#">Engineering Interactive Systems</a>	4,5 CR	
T-WIWI-108437	<a href="#">Practical Seminar: Information Systems and Service Design</a>	4,5 CR	Mädche

### 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.

### Competence Goal

The student

- has a comprehensive understanding of conceptual and theoretical foundations of interactive systems
- knows design processes for interactive systems
- is aware of the most important techniques and tools for designing interactive systems and knows how to apply them to real-world problems
- is able to apply design principles for the design of most important classes of interactive systems,
- creates new solutions of interactive systems teams

### Prerequisites

The course "Interactive Information Systems" is compulsory and must be examined.

### Content

Advanced information and communication technologies make interactive systems ever-present in the users' private and business life. They are an integral part of smartphones, devices in the smart home, mobility vehicles as well as at the working place in production and administration (e.g. in the form of dashboards).

With the continuous growing capabilities of computers, the design of the interaction between human and computer becomes even more important. This module focuses on design processes and principles for interactive systems. The contents of the module abstract from the technical implementation details and focus on foundational concepts, theories, practices and methods for the design of interactive systems. The students get the necessary knowledge to guide the successful implementation of interactive systems in business and private life.

Each lecture in the module is accompanied with a capstone project that is carried out with an industry partner.

### Annotation

See <http://issd.iism.kit.edu/305.php> for further information.

### Workload

The total workload for this module is approximately 270 hours.

## M

## 5.40 Module: Development of Business Information Systems [M-WIWI-101477]

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Informatics

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
5

Election block: Compulsory Elective Courses (between 1 and 2 items)			
T-WIWI-102661	Database Systems and XML	4,5 CR	Oberweis
T-WIWI-102895	Software Quality Management	4,5 CR	Oberweis
Election block: Supplementary Courses (at most 1 item)			
T-WIWI-110346	Supplement Enterprise Information Systems	4,5 CR	Oberweis
T-WIWI-102667	Management of IT-Projects	4,5 CR	Schätzle
T-WIWI-110548	Advanced Lab Informatics (Master)	4,5 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-102669	Strategic Management of Information Technology	4,5 CR	Wolf

### 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

- describe the structure and the components of enterprise information systems,
- explain functionality and architecture of the enterprise information system components ,
- choose and apply relevant components to solve given problems in a methodic approach,
- describe roles, activities and products in the field of software engineering management,
- compare process and quality models and choose an appropriate model in a concrete situation,
- write scientific theses in the areas of enterprise information system components and software engineering management and find own solutions for given problems and research questions.

### Prerequisites

The course *Datenbanksysteme und XML* or the course *Software Quality Management* must be examined.

### Content

An enterprise information system contains the complete application software to store and process data and information in an organisation including design and management of databases, workflow management and strategic information planning.

Due to global networking and geographical distribution of enterprises as well as the increasing acceptance of eCommerce the application of distributed information systems becomes particular important.

This module teaches concepts and methods for design and application of information systems.

### Annotation

The course T-WIWI-102759 "Requirements Analysis and Requirements Management" will no longer be offered in the module as of winter semester 2018/2019.

### Workload

See German version

M

## 5.41 Module: Digital Circuits Design [M-INFO-102978]

**Responsible:** Prof. Dr.-Ing. Uwe Hanebeck  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Language	Level	Version
6	Each summer term	German	4	1

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

## M

## 5.42 Module: Digital Service Systems in Industry [M-WIWI-102808]

**Responsible:** Prof. Dr. Wolf Fichtner  
Prof. Dr. Stefan Nickel

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
5

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-102872	<a href="#">Challenges in Supply Chain Management</a>	4,5 CR	Mohr
T-WIWI-106201	<a href="#">Digital Transformation of Organizations</a>	4,5 CR	Mädche
T-WIWI-102822	<a href="#">Industrial Services</a>	4,5 CR	Fromm
T-WIWI-107043	<a href="#">Liberalised Power Markets</a>	3 CR	Fichtner
T-WIWI-106200	<a href="#">Modeling and OR-Software: Advanced Topics</a>	4,5 CR	Nickel
T-WIWI-106563	<a href="#">Practical Seminar Digital Service Systems</a>	4,5 CR	Satzger

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO), whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal

### Competence Goal

Students

- understand the basics of the management of digital services applied on an industrial context
- gain an industry-specific insight into the importance and most relevant characteristics of information systems as key components of the digitalization of business processes, products and services
- are able to transfer and apply the models and methods introduced on practical scenarios and simulations.
- understand the control and optimization methods in the sector of service management and are able to apply them properly.

### Prerequisites

This module can only be assigned as an elective module.

### Content

This module aims at deepening the fundamental knowledge of digital service management in the industrial context. Various mechanisms and methods to shape and control connected digital service systems in different industries are discussed and demonstrated with real life application cases.

### 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](http://www.ksri.kit.edu/teaching)

### Workload

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



## M

## 5.43 Module: Dynamic IT-Infrastructures [M-INFO-101210]

**Responsible:** Prof. Dr. Hannes Hartenstein  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Level	Version
9	Each term	2 semester	4	2

Election block: Dynamic IT-Infrastructures (at least 1 item as well as at least 9 credits)			
T-INFO-101323	IT-Security Management for Networked Systems	5 CR	Hartenstein
T-INFO-101326	Ubiquitous Computing	5 CR	Beigl
T-INFO-101276	Data and Storage Management	4 CR	Neumair
T-INFO-101284	Integrated Network and Systems Management	4 CR	Neumair
T-INFO-101298	Distributed Computing	4 CR	Streit
T-INFO-101345	Parallel Computer Systems and Parallel Programming	4 CR	Streit
T-INFO-106061	Access Control Systems: Foundations and Practice	4 CR	Hartenstein

**Competence Goal**

The students will get to know established as well as novel concepts for the design, implementation, operation and management of dynamic IT infrastructures (Web, Grid, Cloud, Internet):

- Getting to know established and novel concepts for IT infrastructures
- Application of methods for the evaluation and analysis of dynamic IT infrastructures
- Assessment of tools, protocols and procedures for the operation and management of dynamic IT infrastructures
- Assessment of the strengths and weaknesses of IT infrastructures
- Insight into the practical operation of dynamic IT infrastructures using the example of the operation within the Steinbuch Centre for Computing (SCC)

**Prerequisites**

None

**Content**

This module covers various aspects of dynamic IT infrastructures such as layout, design, concept, development, operation and performance evaluation as well as optimization. These topics are considered from a theoretical-analytical approach as well as from the perspective of the practical experiences of day-to-day use. Being a modern IT service provider, the *Steinbuch Centre for Computing (SCC)* serves as object of study, since it combines both aspects in real life.

## M

## 5.44 Module: Econometrics and Statistics I [M-WIWI-101638]

**Responsible:** Prof. Dr. Melanie Schienle

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

**Part of:** Economics and Management (Elective Modules in Economics and Management)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
4

Mandatory			
T-WIWI-103125	<a href="#">Applied Econometrics</a>	4,5 CR	Schienle
Election block: Supplementary Courses (between 4,5 and 5 credits)			
T-WIWI-103066	<a href="#">Data Mining and Applications</a>	4,5 CR	Nakhaeizadeh
T-WIWI-103064	<a href="#">Financial Econometrics</a>	4,5 CR	Schienle
T-WIWI-103126	<a href="#">Non- and Semiparametrics</a>	4,5 CR	Schienle
T-WIWI-103127	<a href="#">Panel Data</a>	4,5 CR	Heller
T-WIWI-110868	<a href="#">Predictive Modeling</a>	4,5 CR	Krüger
T-WIWI-103065	<a href="#">Statistical Modeling of Generalized Regression Models</a>	4,5 CR	Heller

#### Competence Certificate

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module 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 shows an in depth understanding of advanced Econometric techniques suitable for different types of data. He/She is able to apply his/her theoretical knowledge to real world problems with the help of statistical software and to evaluate performance of different approaches based on statistical criteria.

#### Prerequisites

The course "*Advanced Statistics*" [2520020] is compulsory and must be examined.

#### Content

The courses of this module offer students a broad range of advanced Econometric techniques for state-of-the art data analysis.

#### Workload

The total workload for this module is approximately 270 hours.

## M

## 5.45 Module: Econometrics and Statistics II [M-WIWI-101639]

**Responsible:** Prof. Dr. Melanie Schienle

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

**Part of:** Economics and Management (Elective Modules in Economics and Management)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
3

Election block: Compulsory Elective Courses (between 9 and 10 credits)			
T-WIWI-103066	Data Mining and Applications	4,5 CR	Nakhaeizadeh
T-WIWI-103064	Financial Econometrics	4,5 CR	Schienle
T-WIWI-103124	Multivariate Statistical Methods	4,5 CR	Grothe
T-WIWI-103126	Non- and Semiparametrics	4,5 CR	Schienle
T-WIWI-103127	Panel Data	4,5 CR	Heller
T-WIWI-103128	Portfolio and Asset Liability Management	4,5 CR	Safarian
T-WIWI-110868	Predictive Modeling	4,5 CR	Krüger
T-WIWI-103065	Statistical Modeling of Generalized Regression Models	4,5 CR	Heller
T-WIWI-103129	Stochastic Calculus and Finance	4,5 CR	Safarian

#### 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 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 shows an in depth understanding of advanced Econometric techniques suitable for different types of data. He/She is able to apply his/her theoretical knowledge to real world problems with the help of statistical software and to evaluate performance of different approaches based on statistical criteria.

#### Prerequisites

This module can only be passed if the module "Econometrics and Statistics I" has been finished successfully before.

#### Content

This module builds on prerequisites acquired in Module "Econometrics and Statistics I". The courses of this module offer students a broad range of advanced Econometric techniques for state-of-the-art data analysis.

#### Workload

The total workload for this module is approximately 270 hours.

## M

## 5.46 Module: Economic Theory and its Application in Finance [M-WIWI-101502]

**Responsible:** Prof. Dr. Kay Mitusch

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

Credits	Recurrence	Language	Level	Version
9	Each term	German/English	4	4

Election block: Compulsory Elective Courses (1 item)			
T-WIWI-102609	<a href="#">Advanced Topics in Economic Theory</a>	4,5 CR	Mitusch
T-WIWI-102861	<a href="#">Advanced Game Theory</a>	4,5 CR	Ehrhart, Puppe, Reiß
Election block: Supplementary Courses (1 item)			
T-WIWI-102647	<a href="#">Asset Pricing</a>	4,5 CR	Ruckes, Uhrig-Homburg
T-WIWI-102622	<a href="#">Corporate Financial Policy</a>	4,5 CR	Ruckes
T-WIWI-109050	<a href="#">Corporate Risk Management</a>	4,5 CR	Ruckes
T-WIWI-102623	<a href="#">Financial Intermediation</a>	4,5 CR	Ruckes

### 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 exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately. The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Competence Goal

The students

- have learnt the methods of formal economic modeling, particularly of General Equilibrium Theory and contract theory
- will be able to apply these methods to the topics in Finance, specifically the areas of financial markets and institutions and corporate finance
- have gained many useful insights into the relationship between firms and investors and the functioning of financial markets

### Prerequisites

One of the courses T-WIWI-102861 "Advanced Game Theory" and T-WIWI-102609 "Advanced Topics in Economic Theory" is compulsory.

### Content

The mandatory course "Advanced Topics in Economic Theory" is devoted in equal parts to General Equilibrium Theory and to contract theory. The course "Asset Pricing" will apply techniques of General Equilibrium Theory to valuation of financial assets. The courses "Corporate Financial Policy" and "Finanzintermediation" will apply the techniques of contract theory to issues of corporate finance and financial institutions.

### Workload

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

## M

## 5.47 Module: eEnergy: Markets, Services and Systems [M-WIWI-103720]

**Responsible:** Prof. Dr. Christof Weinhardt

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
1

Election block: Compulsory Elective Courses (at least 9 credits)			
T-WIWI-107501	<a href="#">Energy Market Engineering</a>	4,5 CR	Weinhardt
T-WIWI-107503	<a href="#">Energy Networks and Regulation</a>	4,5 CR	Weinhardt
T-WIWI-107504	<a href="#">Smart Grid Applications</a>	4,5 CR	Weinhardt

### Competence Certificate

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of 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

- is aware of design options for energy and especially electricity markets and can derive implications for the market results from the market design,
- knows about current trends regarding the Smart Grid and understands affiliated modelling approaches,
- can evaluate business models of electricity grids according to the regulation regime
- is prepared for scientific contributions in the field of energy system analysis.

### Prerequisites

None.

### Content

The module conveys scientific and practical knowledge to analyse energy markets and according business models. To do so the scientific discussion on energy market designs is evaluated and analysed. Different energy market models are presented and their design implications are evaluated. Furthermore, the electricity system is analysed with regards to being a network industry and resulting regulation and business models are discussed. Besides these traditional areas of energy economics we will look at methods and models of digitalisation in the energy sector.

### Annotation

The lecture Smart Grid Applications will be available starting in the winter term 2018/19.

### Workload

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

## M

## 5.48 Module: Electronic Markets [M-WIWI-101409]

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

Credits  
9Recurrence  
Each termLanguage  
GermanLevel  
4Version  
4

Election block: Compulsory Elective Courses (at least 9 credits)			
T-WIWI-108880	<a href="#">Blockchains &amp; Cryptofinance</a>	4,5 CR	Schuster, Uhrig-Homburg
T-WIWI-102762	<a href="#">Business Dynamics</a>	4,5 CR	Geyer-Schulz
T-WIWI-102886	<a href="#">Business Administration in Information Engineering and Management</a>	5 CR	Geyer-Schulz
T-WIWI-102640	<a href="#">Market Engineering: Information in Institutions</a>	4,5 CR	Weinhardt
T-WIWI-105946	<a href="#">Price Management</a>	4,5 CR	Geyer-Schulz, Glenn
T-WIWI-102713	<a href="#">Telecommunication and Internet Economics</a>	4,5 CR	Mitusch

**Competence Certificate**

Please note that the course "Business Administration in Information Engineering and Management" is no longer offered and that the examination is only offered in exceptional cases (see description of T-WIWI-102886).

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module 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 coordination and motivation methods and analyzes them regarding their efficiency,
- classifies markets and describes the roles of the participants in a formal way,
- knows the conditions for market failure and knows and develops countermeasures,
- knows institutions and market mechanisms, their fundamental theories and empirical research results,
- knows the design criteria of market mechanisms and a systematical approach for creating new markets,
- models, analyzes and optimizes the structure and dynamics of complex business applications.

**Prerequisites**

None

**Content**

What are the conditions that make electronic markets develop and how can one analyse and optimize such markets?

In this module, the selection of the type of organization as an optimization of transaction costs is treated. Afterwards, the efficiency of electronic markets (price, information and allocation efficiency) as well as reasons for market failure are described. Finally, motivational issues like bounded rationality and information asymmetries (private information and moral hazard), as well as the development of incentive schemes, are presented. Regarding the market design, especially the interdependencies of market organization, market mechanisms, institutions and products are described and theoretical foundations are lectured.

Electronic markets are dynamic systems that are characterized by feedback loops between many different variables. By means of the tools of business dynamics such markets can be modelled. Simulations of complex systems allow the analysis and optimization of markets, business processes, policies, and organizations.

Topics include:

- classification, analysis, and design of markets
- simulation of markets
- auction methods and auction theory
- automated negotiations
- nonlinear pricing
- continuous double auctions
- market-maker, regulation, control

**Recommendation**

None

**Annotation**

The course Price Management is offered for the first time in summer term 2016.

**Workload**

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

## M

## 5.49 Module: Energy Economics and Energy Markets [M-WIWI-101451]

**Responsible:** Prof. Dr. Wolf Fichtner

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

**Part of:** Economics and Management (Elective Modules in Economics and Management)  
Economics and Management (Elective Modules in Business Administration)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	4	6

Mandatory			
T-WIWI-107043	Liberalised Power Markets	3 CR	Fichtner
Election block: Supplementary Courses (at least 6 credits)			
T-WIWI-102691	Energy Trade and Risk Management	3 CR	Cremer, Keles
T-WIWI-102607	Energy Policy	3,5 CR	Wietschel
T-WIWI-107501	Energy Market Engineering	4,5 CR	Weinhardt
T-WIWI-108016	Simulation Game in Energy Economics	3 CR	Genoese
T-WIWI-107446	Quantitative Methods in Energy Economics	3 CR	Keles, Plötz
T-WIWI-102712	Regulation Theory and Practice	4,5 CR	Mitusch

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

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

### Competence Goal

The student

- gains detailed knowledge about the new requirements of liberalised energy markets,
- describes the planning tasks on the different energy markets,
- knows solution approaches to respective planning tasks.

### Prerequisites

The lecture Liberalised Power Markets has to be examined.

### Content

**Liberalised Power Markets:** The European liberalisation process, energy markets, pricing, market failure, investment incentives, market power

**Energy Trade and Risk Management:** trade centres, trade products, market mechanisms, position and risk management

**Simulation Game in Energy Economics:** Simulation of the German electricity system

### 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.

### Workload

The total workload for this module is approximately 270 hours.



## M

## 5.50 Module: Energy Economics and Technology [M-WIWI-101452]

**Responsible:** Prof. Dr. Wolf Fichtner

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	4	4

Election block: Compulsory Elective Courses (at least 9 credits)			
T-WIWI-102793	<a href="#">Efficient Energy Systems and Electric Mobility</a>	3,5 CR	Jochem, McKenna
T-WIWI-102650	<a href="#">Energy and Environment</a>	4,5 CR	Karl
T-WIWI-102830	<a href="#">Energy Systems Analysis</a>	3 CR	Ardone, Fichtner
T-WIWI-107464	<a href="#">Smart Energy Infrastructure</a>	3 CR	Ardone, Pustisek
T-WIWI-102695	<a href="#">Heat Economy</a>	3 CR	Fichtner

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

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

### Competence Goal

The student

- gains detailed knowledge about present and future energy supply technologies (focus on final energy carriers electricity and heat),
- knows the techno-economic characteristics of plants for energy provision, for energy transport as well as for energy distribution and demand,
- is able to assess the environmental impact of these technologies.

### Prerequisites

None

### Content

*Heat Economy:* district heating, heating technologies, reduction of heat demand, statutory provisions

*Energy Systems Analysis:* Interdependencies in energy economics, energy systems modelling approaches in energy economics

*Energy and Environment:* emission factors, emission reduction measures, environmental impact

*Efficient Energy Systems and Electric Mobility:* concepts and current trends in energy efficiency, Overview of and economical, ecological and social impacts through electric mobility

### Workload

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

## M

## 5.51 Module: Entrepreneurship (EnTechnon) [M-WIWI-101488]

**Responsible:** Prof. Dr. Orestis Terzidis

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

<b>Credits</b> 9	<b>Recurrence</b> Each term	<b>Duration</b> 2 semester	<b>Language</b> German/English	<b>Level</b> 4	<b>Version</b> 8
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**Election notes**

The courses "Business Planning for Founders - EUCOR" and the course "International Selling - EUCOR" must be taken together.

Election block: Mandatory part (1 item)			
T-WIWI-102864	<a href="#">Entrepreneurship</a>	3 CR	Terzidis
Election block: Compulsory Elective Courses (1 item)			
T-WIWI-102865	<a href="#">Business Planning</a>	3 CR	Terzidis
T-WIWI-110389	<a href="#">Business Planning for Founders - EUCOR</a>	3 CR	Terzidis
T-WIWI-102866	<a href="#">Design Thinking</a>	3 CR	Terzidis
T-WIWI-102833	<a href="#">Entrepreneurial Leadership &amp; Innovation Management</a>	3 CR	Terzidis
T-WIWI-102894	<a href="#">Entrepreneurship Research</a>	3 CR	Terzidis
T-WIWI-110381	<a href="#">International Selling – EUCOR</a>	3 CR	Casenave , Klarmann
Election block: Supplementary Courses (1 item)			
T-WIWI-102866	<a href="#">Design Thinking</a>	3 CR	Terzidis
T-WIWI-102851	<a href="#">Developing Business Models for the Semantic Web</a>	3 CR	Sure-Vetter
T-WIWI-102833	<a href="#">Entrepreneurial Leadership &amp; Innovation Management</a>	3 CR	Terzidis
T-WIWI-102894	<a href="#">Entrepreneurship Research</a>	3 CR	Terzidis
T-WIWI-102852	<a href="#">Case Studies Seminar: Innovation Management</a>	3 CR	Weissenberger-Eibl
T-WIWI-102639	<a href="#">Business Models in the Internet: Planning and Implementation</a>	4,5 CR	Weinhardt
T-WIWI-102865	<a href="#">Business Planning</a>	3 CR	Terzidis
T-WIWI-110389	<a href="#">Business Planning for Founders - EUCOR</a>	3 CR	Terzidis
T-WIWI-110374	<a href="#">Firm creation in IT security</a>	3 CR	Terzidis
T-WIWI-102893	<a href="#">Innovation Management: Concepts, Strategies and Methods</a>	3 CR	Weissenberger-Eibl
T-WIWI-110381	<a href="#">International Selling – EUCOR</a>	3 CR	Casenave , Klarmann
T-WIWI-109064	<a href="#">Joint Entrepreneurship Summer School</a>	6 CR	Terzidis
T-WIWI-102612	<a href="#">Managing New Technologies</a>	3 CR	Reiß
T-WIWI-102853	<a href="#">Roadmapping</a>	3 CR	Koch

**Competence Certificate**

See German version.

**Competence Goal**

See German version.

**Prerequisites**

None

**Recommendation**

None

**Workload**

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

## M

## 5.52 Module: Environmental Economics [M-WIWI-101468]

**Responsible:** Prof. Dr. Kay Mitusch

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German	4	1

Election block: Compulsory Elective Courses (at least 9 credits)			
T-WIWI-102650	<a href="#">Energy and Environment</a>	4,5 CR	Karl
T-WIWI-100007	<a href="#">Transport Economics</a>	4,5 CR	Mitusch, Szimba
T-WIWI-102615	<a href="#">Environmental Economics and Sustainability</a>	5 CR	Walz
T-WIWI-102616	<a href="#">Environmental and Resource Policy</a>	4 CR	Walz
T-INFO-101348	<a href="#">Environmental Law</a>	3 CR	Barczak

### 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 exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

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

### Competence Goal

The students

- understand the treatment of non-market resources as well as future resource shortages
- are able to model markets of energy and environmental goods
- are able to assess the results of government intervention
- know legal basics and are able to evaluate conflicts with regard to legal situation

### Prerequisites

None

### Content

Environmental degradation and increasing resource use are global challenges, which have to be tackled on a worldwide level. The module addresses these challenges from the perspective of economics, and imparts the fundamental knowledge of environmental and sustainability economics, and environmental and resource policy to the students. Additional courses address environmental law, environmental pressure, and applications to the transport sector.

### Recommendation

Knowledge in the area of microeconomics and of the content of the course *Economics I: Microeconomics*[2600012], respectively, is required.

### Workload

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

## M

## 5.53 Module: Experimental Economics [M-WIWI-101505]

**Responsible:** Prof. Dr. Johannes Philipp Reiß  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
5

Election block: Compulsory Elective Courses (2 items)			
T-WIWI-102614	<a href="#">Experimental Economics</a>	4,5 CR	Weinhardt
T-WIWI-105781	<a href="#">Incentives in Organizations</a>	4,5 CR	Nieken
T-WIWI-102862	<a href="#">Predictive Mechanism and Market Design</a>	4,5 CR	Reiß
T-WIWI-102863	<a href="#">Topics in Experimental Economics</a>	4,5 CR	Reiß

### 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

Students

- are acquainted with the methods of Experimental Economics along with its strengths and weaknesses;
- understand how theory-guided research in Experimental Economics interacts with the development of theory;
- are provided with foundations in data analysis;
- design an economic experiment and analyze its outcome.

### Prerequisites

None.

### Content

The module Experimental Economics offers an introduction into the methods and topics of Experimental Economics. It also fosters and extends knowledge in theory-guided experimental economics and its interaction with theory development. Throughout the module, readings of selected papers are required.

### Recommendation

Basic knowledge in mathematics, statistics, and game theory is assumed.

### Annotation

The course "Predictive Mechanism and Market Design" is offered every second winter semester, e.g. WS2013 / 14, WS2015 / 16, ...

### Workload

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

## M

## 5.54 Module: Finance 1 [M-WIWI-101482]

**Responsible:** Prof. Dr. Martin Ruckes  
Prof. Dr. Marliese Uhrig-Homburg

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	4	1

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-102643	<a href="#">Derivatives</a>	4,5 CR	Uhrig-Homburg
T-WIWI-102621	<a href="#">Valuation</a>	4,5 CR	Ruckes
T-WIWI-102647	<a href="#">Asset Pricing</a>	4,5 CR	Ruckes, Uhrig-Homburg

**Competence Certificate**

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

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

**Competence Goal**

The student

- has core skills in economics and methodology in the field of finance
- assesses corporate investment projects from a financial perspective
- is able to make appropriate investment decisions on financial markets

**Prerequisites**

None

**Content**

The courses of this module equip the students with core skills in economics and methodology in the field of modern finance. Securities which are traded on financial and derivative markets are presented, and frequently applied trading strategies are discussed. A further focus of this module is on the assessment of both profits and risks in security portfolios and corporate investment projects from a financial perspective.

**Workload**

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

## M

## 5.55 Module: Finance 2 [M-WIWI-101483]

**Responsible:** Prof. Dr. Martin Ruckes  
Prof. Dr. Marliese Uhrig-Homburg

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

<b>Credits</b> 9	<b>Recurrence</b> Each term	<b>Duration</b> 1 semester	<b>Language</b> German/English	<b>Level</b> 4	<b>Version</b> 6
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Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-110513	<a href="#">Advanced Empirical Asset Pricing</a>	4,5 CR	Thimme
T-WIWI-102647	<a href="#">Asset Pricing</a>	4,5 CR	Ruckes, Uhrig-Homburg
T-WIWI-108880	<a href="#">Blockchains &amp; Cryptofinance</a>	4,5 CR	Schuster, Uhrig-Homburg
T-WIWI-102622	<a href="#">Corporate Financial Policy</a>	4,5 CR	Ruckes
T-WIWI-109050	<a href="#">Corporate Risk Management</a>	4,5 CR	Ruckes
T-WIWI-102643	<a href="#">Derivatives</a>	4,5 CR	Uhrig-Homburg
T-WIWI-110797	<a href="#">eFinance: Information Systems for Securities Trading</a>	4,5 CR	Weinhardt
T-WIWI-102644	<a href="#">Fixed Income Securities</a>	4,5 CR	Uhrig-Homburg
T-WIWI-102900	<a href="#">Financial Analysis</a>	4,5 CR	Luedecke
T-WIWI-102623	<a href="#">Financial Intermediation</a>	4,5 CR	Ruckes
T-WIWI-102626	<a href="#">Business Strategies of Banks</a>	3 CR	Müller
T-WIWI-102646	<a href="#">International Finance</a>	3 CR	Uhrig-Homburg
T-WIWI-102645	<a href="#">Credit Risk</a>	4,5 CR	Uhrig-Homburg
T-WIWI-110511	<a href="#">Strategic Finance and Technology Change</a>	1,5 CR	Ruckes
T-WIWI-102621	<a href="#">Valuation</a>	4,5 CR	Ruckes

**Competence Certificate**

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

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

**Competence Goal**

The student is in a position to discuss, analyze and provide answers to advanced economic and methodological issues in the field of modern finance.

**Prerequisites**

It is only possible to choose this module in combination with the module *Finance 1*. The module is passed only after the final partial exam of *Finance 1* is additionally passed.

**Content**

The module Finance 2 is based on the module Finance 1. The courses of this module equip the students with advanced skills in economics and methodology in the field of modern finance on a broad basis.

**Annotation**

The courses *eFinance: Information Engineering and Management for Securities Trading* [2540454] and *Financial Analysis* [2530205] can be chosen from summer term 2015 on.

**Workload**

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

## M

## 5.56 Module: Finance 3 [M-WIWI-101480]

**Responsible:** Prof. Dr. Martin Ruckes  
Prof. Dr. Marliese Uhrig-Homburg

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

<b>Credits</b> 9	<b>Recurrence</b> Each term	<b>Duration</b> 1 semester	<b>Language</b> German/English	<b>Level</b> 4	<b>Version</b> 6
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Election block: Compulsory Elective Courses (at least 9 credits)			
T-WIWI-110513	<a href="#">Advanced Empirical Asset Pricing</a>	4,5 CR	Thimme
T-WIWI-102647	<a href="#">Asset Pricing</a>	4,5 CR	Ruckes, Uhrig-Homburg
T-WIWI-108880	<a href="#">Blockchains &amp; Cryptofinance</a>	4,5 CR	Schuster, Uhrig-Homburg
T-WIWI-102622	<a href="#">Corporate Financial Policy</a>	4,5 CR	Ruckes
T-WIWI-109050	<a href="#">Corporate Risk Management</a>	4,5 CR	Ruckes
T-WIWI-102643	<a href="#">Derivatives</a>	4,5 CR	Uhrig-Homburg
T-WIWI-110797	<a href="#">eFinance: Information Systems for Securities Trading</a>	4,5 CR	Weinhardt
T-WIWI-102644	<a href="#">Fixed Income Securities</a>	4,5 CR	Uhrig-Homburg
T-WIWI-102900	<a href="#">Financial Analysis</a>	4,5 CR	Luedecke
T-WIWI-102623	<a href="#">Financial Intermediation</a>	4,5 CR	Ruckes
T-WIWI-102626	<a href="#">Business Strategies of Banks</a>	3 CR	Müller
T-WIWI-102646	<a href="#">International Finance</a>	3 CR	Uhrig-Homburg
T-WIWI-102645	<a href="#">Credit Risk</a>	4,5 CR	Uhrig-Homburg
T-WIWI-110511	<a href="#">Strategic Finance and Technology Change</a>	1,5 CR	Ruckes
T-WIWI-102621	<a href="#">Valuation</a>	4,5 CR	Ruckes

**Competence Certificate**

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

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

**Competence Goal**

The student is in a position to discuss, analyze and provide answers to advanced economic and methodological issues in the field of modern finance.

**Prerequisites**

It is only possible to choose this module in combination with the module *Finance 1* and *Finance 2*. The module is passed only after the final partial exams of *Finance 1* and *Finance 2* are additionally passed.

**Content**

The courses of this module equip the students with advanced skills in economics and methodology in the field of modern finance on a broad basis.

**Workload**

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

## M

## 5.57 Module: FinTech Innovations [M-WIWI-105036]

**Responsible:** Prof. Dr Maxim Ulrich

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
English

**Level**  
4

**Version**  
1

Mandatory			
T-WIWI-106193	<a href="#">Engineering FinTech Solutions</a>	9 CR	Ulrich

### Competence Certificate

The assessment is carried out in form of a written thesis based on the course "Engineering FinTech Solutions".

### Competence Goal

Students with a strong technological background and/or a strong interest for software development and investments will learn how to build a prototype that automates essential steps for a fully automated investment and risk management process. Students also learn to organize themselves efficiently in teams of several developers in order to complete a prototype in a limited amount of time. Moreover, students deepen their understanding of finance and technology and learn how to combine both in an effective way. Students will hence be well prepared to become leaders and pioneers for upcoming FinTech innovations (and beyond) to help society to better invest for the future and to better protect from adverse risks.

### Prerequisites

see T-WIWI-106193 "Engineering FinTech Solutions"

### Content

The module is targeted to students with strong knowledge in the field of computational risk and asset management and strong programming skills. It offers students the opportunity to develop an algorithmic solution and hence ample their programming experience and their understanding of financial economics or asset and risk management.

### Recommendation

None

### Workload

Total effort for 9 credit points: approx. 270 hours.



M

## 5.58 Module: Formal Systems [M-INFO-100799]

**Responsible:** Prof. Dr. Bernhard Beckert  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
6	Each winter term	1 term	German	4	1

Mandatory			
T-INFO-101336	Formal Systems	6 CR	Beckert

M

## 5.59 Module: Formal Systems II: Application [M-INFO-100744]

**Responsible:** Prof. Dr. Bernhard Beckert  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
5	Each summer term	1 term	German	4	1

Mandatory			
T-INFO-101281	<a href="#">Formal Systems II: Application</a>	5 CR	Beckert

M

**5.60 Module: Formal Systems II: Theory [M-INFO-100841]**

**Responsible:** Prof. Dr. Bernhard Beckert  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
5	Each summer term	1 term	German	4	1

Mandatory			
T-INFO-101378	Formal Systems II: Theory	5 CR	Beckert

## M

## 5.61 Module: Future Networking [M-INFO-101205]

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Level	Version
8	Each term	1 semester	4	3

Election block: Future Networking (at least 1 item as well as at least 8 credits)			
T-INFO-101321	<a href="#">Next Generation Internet</a>	4 CR	Bless, Zitterbart
T-INFO-101322	<a href="#">Mobile Communication</a>	4 CR	Waldhorst, Zitterbart
T-INFO-101337	<a href="#">Internet of Everything</a>	4 CR	Zitterbart
T-INFO-101338	<a href="#">Telematics</a>	6 CR	Zitterbart

**Competence Goal**

Each student should be able

- to learn and use the concepts and principals of future network design
- to identify the flaws and benefits of future communication systems
- to judge the performance of protocols, future networks and architectures
- master advanced protocols, architectures and algorithms of future communication systems

**Content**

This module details selected aspects of future communication systems. This includes beside the requirements of secure and multimedia-based communication also the realization and controllability of large communication systems and networks. An important aspect is benchmarking and mastering the used algorithms, protocols and architectures. Also actual developments and applications are in the focus of this module.

M

## 5.62 Module: Geometric Optimization [M-INFO-100730]

**Responsible:** Prof. Dr. Hartmut Prautzsch  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
3	Irregular	1 term	German	4	1

Mandatory			
T-INFO-101267	<a href="#">Geometric Optimization</a>	3 CR	Prautzsch

## M

## 5.63 Module: Governance, Risk &amp; Compliance [M-INFO-101242]

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

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	German	4	5

Mandatory			
T-INFO-101288	<a href="#">Corporate Compliance</a>	3 CR	Dreier
Election block: Governance, Risk & Compliance (at least 1 item as well as at least 6 credits)			
T-INFO-101316	<a href="#">Law of Contracts</a>	3 CR	Dreier
T-INFO-108405	<a href="#">Data Protection by Design</a>	3 CR	Raabe
T-INFO-102047	<a href="#">Seminar: Governance, Risk &amp; Compliance</a>	3 CR	Dreier
T-INFO-109910	<a href="#">IT- Security Law</a>	3 CR	Raabe

## M

## 5.64 Module: Growth and Agglomeration [M-WIWI-101496]

**Responsible:** Prof. Dr. Ingrid Ott

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Language**  
German/English

**Level**  
4

**Version**  
3

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-109194	<a href="#">Dynamic Macroeconomics</a>	4,5 CR	Brumm
T-WIWI-102785	<a href="#">Theory of Endogenous Growth</a>	4,5 CR	Ott
T-WIWI-103107	<a href="#">Spatial Economics</a>	4,5 CR	Ott

### Competence Certificate

The assessment is carried out as partial written exams (see the lectures descriptions).

The overall grade for the module is the average of the grades for each course weighted by the credits.

### Competence Goal

The student

- gains deepened knowledge of micro-based general equilibrium models
- understands how based on individual optimizing decisions aggregate phenomena like economic growth or agglomeration (cities / metropolises) result
- is able to understand and evaluate the contribution of these phenomena to the development of economic trends
- can derive policy recommendations based on theory

### Prerequisites

None

### Content

The module includes the contents of the lectures *Endogenous Growth Theory* [2561503], *Spatial Economics* [2561260] and *International Economic Policy* [2560254]. While the first two lectures have a more formal-analytic focus, the third lecture approaches fundamental ideas and problems from the field of international economic policy from a more verbal perspective.

The common underlying principle of all three lectures in this module is that, based on different theoretical models, economic policy recommendations are derived.

### Recommendation

Attendance of the course *Introduction Economic Policy* [2560280] is recommended.

Successful completion of the courses *Economics I: Microeconomics* and *Economics II: Macroeconomics* is required.

### Workload

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

M

## 5.65 Module: Human Computer Interaction [M-INFO-100729]

**Responsible:** Prof. Dr.-Ing. Michael Beigl  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
6	Each summer term	1 term	German	4	1

Mandatory			
T-INFO-101266	<a href="#">Human-Machine-Interaction</a>	6 CR	Beigl
T-INFO-106257	<a href="#">Human-Machine-Interaction Pass</a>	0 CR	Beigl



## M

## 5.66 Module: Human Factors in Security and Privacy [M-WIWI-104520]

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

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German	4	1

Mandatory			
T-WIWI-109270	<a href="#">Human Factors in Security and Privacy</a>	4,5 CR	Volkamer
T-WIWI-109271	<a href="#">Advanced Lab User Studies in Security</a>	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**

Students ...

- know why many existing security and privacy mechanisms are not usable and why many awareness/education/training approaches are not effective
- can explain for concrete examples why these are not usable / not effective including why people are likely to face problems with these
- can explain what mental models are, why they are important and how they can be identified
- know how to conduct a cognitive walkthrough to identify problems with existing mechanisms and approaches
- know how to conduct semi-structured interviews
- know how user studies in the security context differ from those conducted in other contexts
- can explain the process of human centered security / privacy by design
- know the advantages and disadvantages of various graphical password schemes
- know concepts such as just in time and place security interventions

**Prerequisites**

None

**Content**

The history of information security and privacy has taught us that it takes more than technological innovation to develop effective security and privacy mechanisms: Many aspects of information security and privacy actually depend on both technical and human factors. As a result of focusing on the technical factors, we are seeing a persistent gap between theoretical security and actual security in real world which becomes an increasing problem in the age of digitalization. The gap is mainly caused by strong and actually unrealistic assumptions regarding the users' knowledge and behavior.

Human factors in security and privacy research addresses several types of security and privacy mechanisms, e.g., authentication mechanisms including text and graphical passwords, security and privacy indicators (such as the icons in the address bar of nowadays web browsers) and security and privacy interventions like warning messages, permission dialogs and security and privacy policies as well as corresponding configuration interfaces. Besides security and privacy mechanisms, human factors in security and privacy researchers deal with security and privacy awareness, education, and training approaches.

'Human factors in security & privacy' research areas are:

- identifying users' mental models using techniques such as (semi-)structured interviews or focus groups,
- evaluating existing approaches regarding their effectiveness in supporting their users in making secure decisions / informed decisions in the context of privacy using techniques such as cognitive walkthroughs, lab user studies or even field studies,
- proposing improved / new approaches and evaluating their effectiveness using the so called human-centered security / privacy by design approach.

This module discusses the various problems of existing security and privacy mechanisms and security and privacy awareness/education/training approaches. The lecture addresses relevant psychological and sociological aspects which are important to know and to consider when developing more usable security/privacy mechanisms and more effective awareness/education/training approaches. The human centered security and privacy by design approach is introduced. Furthermore, some of the methodologies used in this area are explained and a subset of them is applied. Finally, positive examples, such as graphical passwords, are introduced and discussed. Note, the main part of the exercise is replicating an interview based study. The main focus of the lab will be to replicate a quantitative based user study.

**Annotation**

This new module can be chosen from winter term 2018/2019.

**Workload**

The total workload for this module is approximately 270 hours.

M

## 5.67 Module: Image Data Compression [M-INFO-100755]

**Responsible:** Prof. Dr.-Ing. Jürgen Beyerer  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

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

Mandatory			
T-INFO-101292	<a href="#">Image Data Compression</a>	3 CR	Beyerer, Pak

## M

## 5.68 Module: Industrial Production II [M-WIWI-101471]

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

Credits	Recurrence	Duration	Language	Level	Version
9	Each winter term	1 semester	German/English	4	2

Mandatory			
T-WIWI-102631	Planning and Management of Industrial Plants	5,5 CR	Schultmann
Election block: Supplementary Courses (at most 1 item)			
T-WIWI-102763	Supply Chain Management with Advanced Planning Systems	3,5 CR	Bosch, Göbelt
T-WIWI-102826	Risk Management in Industrial Supply Networks	3,5 CR	Schultmann, Wiens
T-WIWI-102828	Supply Chain Management in the Automotive Industry	3,5 CR	Heupel, Lang
T-WIWI-103134	Project Management	3,5 CR	Schultmann
Election block: Supplementary Courses (at most 1 item)			
T-WIWI-102634	Emissions into the Environment	3,5 CR	Karl
T-WIWI-102882	International Management in Engineering and Production	3,5 CR	Sasse
T-WIWI-110512	Life Cycle Assessment	3,5 CR	Schultmann

**Competence Certificate**

The assessment is carried out as partial exams (according to section 4 (2), 1 SPO) of the core course *Planning and Managing of Industrial Plants* [2581952] 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 able to describe the tasks of tactical production management with special attention drawn upon industrial plants.
- Students shall understand the relevant tasks in plant management (projection, realisation and supervising tools for industrial plants).
- Students shall be able to describe the special need of a techno-economic approach to solve problems in the field of tactical production management.
- Students shall be proficient in using selected techno-economic methods like investment and cost estimates, plant layout, capacity planning, evaluation principles of production techniques, production systems as well as methods to design and optimize production systems.
- Students shall be able to evaluate techno-economical approaches in planning tactical production management with respect to their efficiency, accuracy and relevance for industrial use.

**Prerequisites**

The course *Planning and Managing of Industrial Plants* [2581952] and at least one additional activity are compulsory and must be examined.

**Content**

- Planning and Management of Industrial Plants: Basics, circulation flow starting from projecting to techno-economic evaluation, construction and operating up to plant dismantling.

**Annotation**

Apart from the core course the courses offered are recommendations and can be replaced by courses from the Module Industrial Production III.

**Workload**

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

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

## M

## 5.69 Module: Industrial Production III [M-WIWI-101412]

**Responsible:** Prof. Dr. Frank Schultmann

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each summer term	1 semester	German/English	4	2

Mandatory			
T-WIWI-102632	<a href="#">Production and Logistics Management</a>	5,5 CR	Glöser-Chahoud, Schultmann
Election block: Supplementary Courses from Module Industrial Production II (at most 1 item)			
T-WIWI-102634	<a href="#">Emissions into the Environment</a>	3,5 CR	Karl
T-WIWI-102882	<a href="#">International Management in Engineering and Production</a>	3,5 CR	Sasse
T-WIWI-110512	<a href="#">Life Cycle Assessment</a>	3,5 CR	Schultmann
Election block: Supplementary Courses (at most 1 item)			
T-WIWI-102763	<a href="#">Supply Chain Management with Advanced Planning Systems</a>	3,5 CR	Bosch, Göbelt
T-WIWI-102826	<a href="#">Risk Management in Industrial Supply Networks</a>	3,5 CR	Schultmann, Wiens
T-WIWI-102828	<a href="#">Supply Chain Management in the Automotive Industry</a>	3,5 CR	Heupel, Lang
T-WIWI-103134	<a href="#">Project Management</a>	3,5 CR	Schultmann

### Competence Certificate

The assessment is carried out as partial exams (according to section 4 (2), 1 SPO) of the core course *Production and Logistics Management* [2581954] 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

- Students describe the tasks concerning general problems of an operative production and logistics management.
- Students describe the planning tasks of supply chain management.
- Students use proficiently approaches to solve general planning problems.
- Students explain the existing interdependencies between planning tasks and applied methods.
- Students describe the main goals and set-up of software supporting tools in production and logistics management (i.e. APS, PPS-, ERP- and SCM Systems).
- Students discuss the scope of these software tools and their general disadvantages.

### Prerequisites

The course *Production and Logistics Management* [2581954] and at least one additional activity are compulsory and must be examined.

### Content

- Planning tasks and exemplary methods of production planning and control in supply chain management.
- Supporting software tools in production and logistics management (APS, PPS- and ERP Systems).
- Project management in the field of production and supply chain management.

### Annotation

Apart from the core course the courses offered are recommendations and can be replaced by courses from the Module Industrial Production II.

**Workload**

The total amount of work for this module is approx. 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 results from the effort required to attend the lectures and exercises, as well as the examination times and the time required to achieve the learning objectives of the module for an average student for an average performance.

## M

## 5.70 Module: Information Engineering and Management [M-WIWI-101443]

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
Prof. Dr. Christof Weinhardt

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

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

Credits	Recurrence	Duration	Level	Version
10	Each term	2 semester	4	3

Mandatory			
T-WIWI-110373	<a href="#">Advanced Information Systems</a>	5 CR	Mädche, Weinhardt
T-WIWI-102886	<a href="#">Business Administration in Information Engineering and Management</a>	5 CR	Geyer-Schulz

**Competence Certificate**

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of each course of this module, whose sum of credits 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

- understands and analyzes the central role of information as an economic good, a production factor, and a competitive factor,
- identifies, evaluates, prices, and markets information goods,
- evaluates informations flows and the value of information in an interdisciplinary context,
- works out solutions in teams,
- transfers models from Business Administration to situations in business whose basic conditions are changed due to the implementation of information and communication technology,
- applies methods from Business Administration (Decision theory, game theory, operations research, etc.) to questions of Information Engineering and Management,
- analyzes the potential to automatize the decision making process in businesses by data bases,
- describes the process to extract relevant data for decision making from operational accounting systems.

**Content**

The module Information Engineering and Management comprises the lectures Advanced Information Systems and Business Administration in Information Engineering and Management.

In the lecture Advanced Information Systems, a clear distinction of information as a production, competitive, and economic good is introduced. The central role of information is explained through the concept of the information lifecycle. The single phases from extraction/generation through storage transformation and evaluation until the marketing and usage of information are analyzed from the business administration perspective and the microeconomic perspective. The state of the art of economic theory is presented throughout the different phases of the information lifecycle. The lecture is complemented by accompanying exercise courses.

In the lecture Business Administration in Information Engineering and Management, classical Business Administration is applied to businesses in an information- and communication technological environment. The process to extract relevant data for decision making from operational accounting systems receives special attention. In order to do so, topics such as activity-based costing and transaction costs models are addressed. The automatization of the decision making process in businesses by data bases is another focus of the module. To solve such issues within a company, relevant methods such as decision theory and game theory are lectured. Finally, complex business relevant questions in a dynamically changing environment are addressed by presenting models and methods from system dynamics.



## M

## 5.71 Module: Information Systems in Organizations [M-WIWI-104068]

**Responsible:** Prof. Dr. Alexander Mädche

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
3

Election block: Compulsory Elective Courses (at least 9 credits)			
T-WIWI-105777	<a href="#">Business Intelligence Systems</a>	4,5 CR	Mädche, Nadj, Toreini
T-WIWI-110851	<a href="#">Designing Interactive Systems</a>	4,5 CR	Mädche, Morana
T-WIWI-106201	<a href="#">Digital Transformation of Organizations</a>	4,5 CR	Mädche
T-WIWI-108437	<a href="#">Practical Seminar: Information Systems and Service Design</a>	4,5 CR	Mädche

### 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

- has a comprehensive understanding of conceptual and theoretical foundations of information systems in organizations
- is aware of the most important classes of information systems used in organizations: process-centric, information-centric and people-centric information systems.
- knows the most important activities required to execute in the pre-implementation, implementation and post-implementation phase of information systems in organizations in order to create business value
- has a deep understanding of key capabilities of business intelligence systems and/or interactive information systems used in organizations

### Prerequisites

None

### Content

During the last decades we witnessed a growing importance of Information Technology (IT) in the business world along with faster and faster innovation cycles. IT has become core for businesses from an operational company-internal and external customer perspective. Today, companies have to rethink their way of doing business, from an internal as well as an external digitalization perspective.

This module focuses on the internal digitalization perspective. The contents of the module abstract from the technical implementation details and focus on foundational concepts, theories, practices and methods for information systems in organizations. The students get the necessary knowledge to guide the successful digitalization of organizations. Each lecture in the module is accompanied with a capstone project that is carried out in cooperation with an industry partner.

### Annotation

New module starting summer term 2018.

### Workload

The total workload for this module is approximately 270 hours.

## M

**5.72 Module: Innovation and Growth [M-WIWI-101478]****Responsible:** Prof. Dr. Ingrid Ott**Organisation:** KIT Department of Economics and Management**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)**Credits**  
9**Recurrence**  
Each term**Duration**  
1 semester**Language**  
German/English**Level**  
4**Version**  
3

Election block: Compulsory Elective Courses (between 9 and 10 credits)			
T-WIWI-109194	<a href="#">Dynamic Macroeconomics</a>	4,5 CR	Brumm
T-WIWI-102785	<a href="#">Theory of Endogenous Growth</a>	4,5 CR	Ott
T-WIWI-102840	<a href="#">Innovation Theory and Policy</a>	4,5 CR	Ott

**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 offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

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

**Competence Goal**

Students shall be given the ability to

- know the basic techniques for analyzing static and dynamic optimization models that are applied in the context of micro- and macroeconomic theories
- understand the important role of innovation to the overall economic growth and welfare
- identify the importance of alternative incentive mechanisms for the emergence and dissemination of innovations
- explain, in which situations market interventions by the state, for example taxes and subsidies, can be legitimized, and evaluate them in the light of economic welfare

**Prerequisites**

None

**Content**

The module includes courses that deal with issues of innovation and growth in the context of micro- and macroeconomic theories. The dynamic analysis makes it possible to analyze the consequences of individual decisions over time, and sheds light on the tension between static and dynamic efficiency in particular. In this context is also analyzed, which policy is appropriate to carry out corrective interventions in the market and thus increase welfare in the presence of market failure.

**Recommendation**

Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required.

**Workload**

Total expenditure of time for 9 credits: 270 hours

Attendance time per lecture: 3x14h

Preparation and wrap-up time per lecture: 3x14h

Rest: Exam Preparation

The exact distribution is subject to the credits of the courses of the module.

## M

## 5.73 Module: Innovation Economics [M-WIWI-101514]

**Responsible:** Prof. Dr. Ingrid Ott

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	German/English	4	2

Election block: Compulsory Elective Courses (between 9 and 10 credits)			
T-WIWI-102840	<a href="#">Innovation Theory and Policy</a>	4,5 CR	Ott
T-WIWI-102906	<a href="#">Methods in Economic Dynamics</a>	1,5 CR	Ott
T-WIWI-109864	<a href="#">Product and Innovation Management</a>	3 CR	Klarmann
T-WIWI-102789	<a href="#">Seminar in Economic Policy</a>	3 CR	Ott

### 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 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 given the ability to

- understand the important role of innovation for economic growth and welfare
- understand the relevance of alternative incentive mechanisms for the emergence and dissemination of innovations
- know basic terms of product and innovation concepts
- know fundamental concepts of innovation management
- work with fundamental theoretical innovation models and to implement them in appropriate computer algebra systems
- query appropriate data sources and to analyse and visualise them using statistical methods

### Prerequisites

None

### Content

The module provides students with knowledge about implications of technological and organizational changes.

Addressed economic issues are incentives for developing innovations, diffusion processes, and associated effects. In this context the module analyses appropriate policies in the presence of market failures to take corrective action on the market process and thus to increase the dynamic efficiency of economies.

Furthermore, the module offers the possibility to learn about different aspects of theoretical modelling of innovation-based growth as a part of the seminar and the methods-workshop. This includes the implementation of formal models in computer algebra systems as well as recording, processing and econometric analysis of related data from relational databases (concerning for example patents or trademarks). Moreover, methods of network theory are applied.

Finally, the module emphasises the business perspective: Issues of all stages of innovation processes will be discussed, from innovation strategies up to the market commercialisation.

### Recommendation

Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012] and Economics II [2600014]. Further, it is assumed that students have interest in using quantitative-mathematical methods.

### Workload

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

## M

## 5.74 Module: Innovation Management [M-WIWI-101507]

**Responsible:** Prof. Dr. Marion Weissenberger-Eibl  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Economics and Management (Elective Modules in Economics and Management)  
 Economics and Management (Elective Modules in Business Administration)

<b>Credits</b> 9	<b>Recurrence</b> Each term	<b>Duration</b> 1 semester	<b>Language</b> German/English	<b>Level</b> 4	<b>Version</b> 7
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Mandatory			
T-WIWI-102893	Innovation Management: Concepts, Strategies and Methods	3 CR	Weissenberger-Eibl
Election block: Compulsory Elective Courses (1 item)			
T-WIWI-102873	Current Issues in Innovation Management	3 CR	Weissenberger-Eibl
T-WIWI-110867	The negotiation of open innovation	3 CR	Beyer
T-WIWI-108875	Digital Transformation and Business Models	3 CR	Koch
T-WIWI-102852	Case Studies Seminar: Innovation Management	3 CR	Weissenberger-Eibl
T-WIWI-108774	Analyzing and Evaluating Innovation Processes	3 CR	Beyer
T-WIWI-110234	Innovation Processes Live	3 CR	Beyer
T-WIWI-110263	Methods in Innovation Management	3 CR	Koch
T-WIWI-102853	Roadmapping	3 CR	Koch
T-WIWI-109932	A Closer Look at Social Innovation	3 CR	Beyer
T-WIWI-102858	Technology Assessment	3 CR	Koch
T-WIWI-102854	Technologies for Innovation Management	3 CR	Koch
Election block: Supplementary Courses (1 item)			
T-WIWI-102873	Current Issues in Innovation Management	3 CR	Weissenberger-Eibl
T-WIWI-102866	Design Thinking	3 CR	Terzidis
T-WIWI-110867	The negotiation of open innovation	3 CR	Beyer
T-WIWI-108875	Digital Transformation and Business Models	3 CR	Koch
T-WIWI-102833	Entrepreneurial Leadership & Innovation Management	3 CR	Terzidis
T-WIWI-102864	Entrepreneurship	3 CR	Terzidis
T-WIWI-102852	Case Studies Seminar: Innovation Management	3 CR	Weissenberger-Eibl
T-WIWI-108774	Analyzing and Evaluating Innovation Processes	3 CR	Beyer
T-WIWI-110234	Innovation Processes Live	3 CR	Beyer
T-WIWI-110263	Methods in Innovation Management	3 CR	Koch
T-WIWI-102853	Roadmapping	3 CR	Koch
T-WIWI-109932	A Closer Look at Social Innovation	3 CR	Beyer
T-WIWI-102854	Technologies for Innovation Management	3 CR	Koch
T-WIWI-102858	Technology Assessment	3 CR	Koch

**Competence Certificate**

See German version.

**Competence Goal**

Students develop a comprehensive understanding of the innovation process and its conditionality. There is an additional focus on the concepts and processes which are of particular relevance with regard to shaping the entire process. Various strategies and methods are then taught based on this.

After completing the module, students should have developed a systemic understanding of the innovation process and be able to shape this by developing and applying suitable methods.

**Prerequisites**

The lecture “Innovation Management: Concepts, Strategies and Methods” and one of the seminars of the chair for Innovation and Technology Management are compulsory. The third course can be chosen from the courses of the module.

**Content**

The Innovation Management: Concepts, Strategies and Methods lecture course teaches concepts, strategies and methods which help students to form a systemic understanding of the innovation process and how to shape it. Building on this holistic understanding, the seminar courses then go into the subjects in greater depth and address specific processes and methods which are central to innovation management.

**Recommendation**

None

**Workload**

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

## M

**5.75 Module: Innovative Concepts of Data and Information Management [M-INFO-101208]**

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits  
8Recurrence  
Each termDuration  
1 semesterLevel  
4Version  
2

Election block: Innovative Concepts of Data and Information Management (at least 1 item as well as at least 8 credits)			
T-INFO-101305	<a href="#">Big Data Analytics</a>	5 CR	Böhm
T-INFO-101306	<a href="#">Datamanagement in the Cloud</a>	5 CR	Böhm
T-INFO-101317	<a href="#">Deployment of Database Systems</a>	5 CR	Böhm
T-INFO-101975	<a href="#">Consulting in Practice</a>	1,5 CR	Böhm
T-INFO-101976	<a href="#">Project Management in Practice</a>	1,5 CR	Böhm
T-INFO-101977	<a href="#">Selling IT-Solutions Professionally</a>	1,5 CR	Böhm
T-INFO-101257	<a href="#">Mechanisms and Applications of Workflow Systems</a>	5 CR	Mülle
T-INFO-105742	<a href="#">Big Data Analytics 2</a>	3 CR	Böhm
T-INFO-108377	<a href="#">Data Privacy: From Anonymization to Access Control</a>	3 CR	Böhm

**Competence Certificate**

Siehe Teilleistung.

**Competence Goal**

The students

- know the research area of information systems in its various facets and are able to do scientific work in this area,
- are able to develop complex information systems on their own,
- are able to structure and manage complex projects in the field of information systems with unpredictable difficulties,
- are able to explain and to discuss complex aspects of the topics covered by this module with both experts and informed outsiders.

**Prerequisites**

None

**Content**

This module aims at exposing students to modern information management, both, in 'breadth' and 'depth'. We achieve 'breadth' by means of a close inspection and comparison of different systems and their respective aims. We achieve 'depth' by means of an extensive examination of the underlying concepts and design alternatives, their assessment as well as by discussing applications.

**Annotation**

The courses of this module are offered irregularly. Nonetheless, it is guaranteed that the module can be passed anytime.

## M

## 5.76 Module: Intellectual Property Law [M-INFO-101215]

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

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German	4	3

Election block: Intellectual Property Law (at least 1 item as well as at least 9 credits)			
T-INFO-102036	<a href="#">Computer Contract Law</a>	3 CR	Dreier
T-INFO-101308	<a href="#">Copyright</a>	3 CR	Dreier
T-INFO-101310	<a href="#">Patent Law</a>	3 CR	Dreier
T-INFO-101313	<a href="#">Trademark and Unfair Competition Law</a>	3 CR	Matz
T-INFO-101307	<a href="#">Internet Law</a>	3 CR	Dreier
T-INFO-108462	<a href="#">Selected Legal Issues of Internet Law</a>	3 CR	Dreier

**Prerequisites**  
None

## M

**5.77 Module: Intelligent Risk and Investment Advisory [M-WIWI-103247]**

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(Elective Modules in Business Administration\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
English

**Level**  
4

**Version**  
3

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-106442	<a href="#">Building Intelligent and Robo-Advised Portfolios</a>	9 CR	Ulrich
T-WIWI-107032	<a href="#">Computational Risk and Asset Management I</a>	4,5 CR	Ulrich
T-WIWI-106494	<a href="#">Computational Risk and Asset Management II</a>	4,5 CR	Ulrich
T-WIWI-106193	<a href="#">Engineering FinTech Solutions</a>	9 CR	Ulrich

**Competence Certificate**

The module will be cancelled for the winter semester 2019/2020.

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

**Competence Goal**

Students obtain a practical and yet research oriented introduction into the field of quantitative and computational risk and investment management. Students learn how to use concepts from computer science, statistics, OR and economics to build intelligent risk and investment systems. Based on personal preferences, students can specialize within the module on either more practical programming and statistical learning points or more on the economic and mathematical insights and intuition.

After successful completion of the module, students know the industry intuition as well as state-of-the-art academic 'financial engineering' methods necessary to successfully contribute to sustainable and value oriented innovations in the field of intelligent risk and investment advisory.

**Prerequisites**

None.

**Content**

The lecture "Building Intelligent and Robo-Advised Portfolios" offers an application-oriented introduction to intelligent and automated portfolio management.

The lectures "Computational Risk and Asset Management" offer an application-oriented introduction to financial market modeling with modern statistical concepts. The acquired knowledge is helpful for quantitative industry internships and jobs, as well as for further quantitative and/or data analysis oriented lectures/seminars/final papers at FBV and other KIT institutes. In terms of content, the student learns to analyse fundamental problems of financial market modelling, such as the prediction of returns, risk distributions and risk premiums, using probabilistic concepts and to solve them independently using modern software. The intuitive and at the same time rigorous interaction of statistical modelling on the one hand and the application to new financial market problems on the other hand characterizes the teaching philosophy of the course. All necessary statistical and financial specific concepts are discussed in the lectures. The students are given numerous possibilities to solve current financial problems independently with modern software. The learning of the programming language Python is part of the teaching program.

Within the scope of the lecture "Engineering FinTech Solutions" students get the opportunity to solve a subproblem from a larger FinTech problem independently and at the same time with close mentoring - by employee and professor of the C-RAM research group. The student is introduced to the problem to be solved on the basis of his very own level of knowledge and equipped with the necessary aids. Students are given the opportunity to combine new research approaches from the field of risk and investment management with modern information technology in order to independently master a step towards prototype development. Depending on the topic, students work alone or in teams. As part of the close mentoring approach, teams will meet weekly to discuss their progress and open questions with course students and the professor.

**Recommendation**

None

**Annotation**

See respective lecture



**Workload**

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

## M

## 5.78 Module: Intelligent Systems and Services [M-WIWI-101456]

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	4	6

Election block: Compulsory Elective Courses (between 9 and 10 credits)			
T-WIWI-102661	<a href="#">Database Systems and XML</a>	4,5 CR	Oberweis
T-WIWI-106423	<a href="#">Information Service Engineering</a>	4,5 CR	Sack
T-WIWI-110548	<a href="#">Advanced Lab Informatics (Master)</a>	4,5 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-102666	<a href="#">Knowledge Discovery</a>	4,5 CR	Sure-Vetter

**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.

Algorithms for Internet Applications [T-WIWI-102658]: The examination will be offered latest until summer term 2017 (repeaters only).

**Competence Goal**

Students

- know the different machine learning procedures for the supervised as well as the unsupervised learning,
- identify the pros and cons of the different learning methods,
- apply the discussed network learning methods in specific scenarios,
- compare the practicality of methods and algorithms with alternative approaches.

**Prerequisites**

None

**Content**

In the broader sense learning systems are understood as biological organisms and artificial systems which are able to change their behavior by processing outside influences. Network leaning methods based on symbolic, statistic and neuronal approaches are the focus of Computer Sciences.

In this module the most important network learning methods are introduced and their applicability is discussed with regard to different information sources such as data texts and images considering especially procedures for knowledge acquirement via data and text mining, natural analogue procedures as well as the application of organic learning procedures within the finance sector.

**Annotation**

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

M

**5.79 Module: Introduction to Video Analysis [M-INFO-100736]**

**Responsible:** Prof. Dr.-Ing. Jürgen Beyerer  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

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

Mandatory			
T-INFO-101273	<a href="#">Introduction to Video Analysis</a>	3 CR	Beyerer

M

**5.80 Module: Lab Course: Natural Language Processing and Software Engineering [M-INFO-103138]**

**Responsible:** Prof. Dr. Walter Tichy  
**Organisation:** KIT Department of Informatics  
**Part of:** [Informatics](#)

<b>Credits</b> 5	<b>Recurrence</b> Each winter term	<b>Language</b> German	<b>Level</b> 4	<b>Version</b> 1
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Mandatory			
T-INFO-106239	<a href="#">Lab Course: Natural Language Processing and Software Engineering</a>	5 CR	Tichy

M

**5.81 Module: Lab: Graph Visualization in Practice [M-INFO-103302]**

**Responsible:** Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** [Informatics](#)

Credits	Recurrence	Language	Level	Version
5	Irregular	German	4	1

Mandatory			
T-INFO-106580	<a href="#">Lab: Graph Visualization in Practice</a>	5 CR	Wagner

## M

## 5.82 Module: Laboratory Course Algorithm Engineering [M-INFO-102072]

**Responsible:** Prof. Dr. Peter Sanders  
 Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** [Informatics](#)

<b>Credits</b> 6	<b>Recurrence</b> Irregular	<b>Language</b> German/English	<b>Level</b> 4	<b>Version</b> 1
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Mandatory			
T-INFO-104374	<a href="#">Laboratory Course Algorithm Engineering</a>	6 CR	Sanders, Wagner

M

## 5.83 Module: Language Technology and Compiler [M-INFO-100806]

**Responsible:** Prof. Dr.-Ing. Gregor Snelting  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
8	Each summer term	1 term	German	4	1

Mandatory			
T-INFO-101343	Language Technology and Compiler	8 CR	Snelting

## M

## 5.84 Module: Machine Learning [M-WIWI-103356]

**Responsible:** Prof. Dr.-Ing. Johann Marius Zöllner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	4	2

Election block: Compulsory Elective Courses (between 9 and 10 credits)			
T-WIWI-106340	<a href="#">Machine Learning 1 - Basic Methods</a>	4,5 CR	Zöllner
T-WIWI-106341	<a href="#">Machine Learning 2 - Advanced Methods</a>	4,5 CR	Zöllner
T-WIWI-109985	<a href="#">Project Lab Cognitive Automobiles and Robots</a>	4,5 CR	Zöllner
T-WIWI-109983	<a href="#">Project Lab Machine Learning</a>	4,5 CR	Zöllner

**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**

- Students gain knowledge of the basic methods in the field of machine learning.
- Students understand advanced concepts of machine learning and their application.
- Students can classify, formally describe and evaluate methods of machine learning.
- Students can use their knowledge to select suitable models and methods for selected problems in the field of machine learning.

**Prerequisites**

None

**Content**

The subject area of machine intelligence and, in particular, machine learning, taking into account real challenges of complex application domains, is a rapidly expanding field of knowledge and the subject of numerous research and development projects.

The lecture "Machine Learning 1" covers both symbolic learning methods such as inductive learning (learning from examples, learning by observation), deductive learning (explanation-based learning) and learning from analogies, as well as subsymbolic techniques such as neural networks, support vector machines, genetic Algorithms and reinforcement learning. The lecture introduces the basic principles as well as fundamental structures of learning systems and the learning theory and examines the previously developed algorithms. The design and operation of learning systems is presented and explained in some examples, especially in the fields of robotics, autonomous mobile systems and image processing.

The lecture "Machine Learning 2" deals with advanced methods of machine learning such as semi-supervised and active learning, deep neural networks (deep learning), pulsed networks, hierarchical approaches, e.g. As well as dynamic, probabilistic relational methods. Another focus is the embedding and application of machine learning methods in real systems.

The lecture introduces the latest basic principles as well as extended basic structures and elucidates previously developed algorithms. The structure and the mode of operation of the methods and methods are presented and explained by means of some application scenarios, especially in the field of technical (sub) autonomous systems (robotics, neurorobotics, image processing, etc.).

**Workload**

The total workload for this module is approximately 270 hours.



M

## 5.85 Module: Machine Learning - Basic Methods [M-INFO-105252]

**Responsible:** Prof. Dr. Gerhard Neumann  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

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

Mandatory			
T-INFO-110630	<a href="#">Machine Learning - Basic Methods</a>	3 CR	Neumann

## M

## 5.86 Module: Machine Vision [M-INFO-101239]

**Responsible:** Prof. Dr.-Ing. Jürgen Beyerer  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Level	Version
9	Each term	1 semester	4	4

Election block: Optional Courses (at least 1 item as well as at least 3 credits)			
T-INFO-101273	<a href="#">Introduction to Video Analysis</a>	3 CR	Beyerer
T-INFO-101292	<a href="#">Image Data Compression</a>	3 CR	Beyerer, Pak
T-INFO-101363	<a href="#">Automated Visual Inspection and Image Processing</a>	6 CR	Beyerer
Election block: Optional Courses (at least 1 item as well as at least 6 credits)			
T-INFO-101362	<a href="#">Pattern Recognition</a>	3 CR	Beyerer
T-INFO-101347	<a href="#">Computer Vision for Human-Computer Interaction</a>	6 CR	Stiefelhagen
T-INFO-101297	<a href="#">Biometric Systems for Person Identification</a>	3 CR	Stiefelhagen
T-INFO-105943	<a href="#">Practical Course Computer Vision for Human-Computer Interaction</a>	3 CR	Stiefelhagen
T-INFO-109796	<a href="#">Deep Learning for Computer Vision</a>	3 CR	Stiefelhagen

## M

## 5.87 Module: Management Accounting [M-WIWI-101498]

**Responsible:** Prof. Dr. Marcus Wouters

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	English	4	2

Mandatory				
T-WIWI-102800	<a href="#">Management Accounting 1</a>		4,5 CR	Wouters
T-WIWI-102801	<a href="#">Management Accounting 2</a>		4,5 CR	Wouters

### Competence Certificate

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

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

### Competence Goal

Students

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

### Prerequisites

None

### Content

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

### Annotation

The following courses are part of this module:

- The course Management Accounting 1, which is offered in every sommer semester
- The course Management Accounting 2, which is offered in every winter semester

### Workload

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

## M

## 5.88 Module: Market Engineering [M-WIWI-101446]

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

<b>Credits</b> 9	<b>Recurrence</b> Each term	<b>Duration</b> 1 semester	<b>Language</b> German/English	<b>Level</b> 4	<b>Version</b> 6
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Mandatory			
T-WIWI-102640	<a href="#">Market Engineering: Information in Institutions</a>	4,5 CR	Weinhardt
Election block: Supplementary Courses (4,5 credits)			
T-WIWI-102613	<a href="#">Auction Theory</a>	4,5 CR	Ehrhart
T-WIWI-108880	<a href="#">Blockchains &amp; Cryptofinance</a>	4,5 CR	Schuster, Uhrig-Homburg
T-WIWI-110797	<a href="#">eFinance: Information Systems for Securities Trading</a>	4,5 CR	Weinhardt
T-WIWI-107501	<a href="#">Energy Market Engineering</a>	4,5 CR	Weinhardt
T-WIWI-107503	<a href="#">Energy Networks and Regulation</a>	4,5 CR	Weinhardt
T-WIWI-102614	<a href="#">Experimental Economics</a>	4,5 CR	Weinhardt
T-WIWI-107504	<a href="#">Smart Grid Applications</a>	4,5 CR	Weinhardt

**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

- know the design criterias of market mechanisms and the systematic approach to create new markets,
- understand the basics of the mechanism design and auction theory,
- analyze and evaluate existing markets regarding the missing incentives and the optimal solution of a given market mechanism, respectively,
- develop solutions in teams.

**Prerequisites**

The course *Market Engineering: Information in Institutions* [2540460] is compulsory and must be examined.

**Content**

This module explains the dependencies between the design von markets and their success. Markets are complex interaction of different institution and participants in a market behave strategically according to the market rules. The development and the design of markets or market mechanisms has a strong influence on the behavior of the participants. A systematic approach and a thorough analysis of existing markets is inevitable to design, create and operate a market place successfully. the approaches for a systematic analysis are explained in the mandatory course *Market Engineering* [2540460] by discussing theories about mechanism design and institutional economics. The student can deepen his knowledge about markets in a second course.

**Recommendation**

None

**Annotation**

The course "Computational Economics" [2590458] will not be offered any more in this module from winter term 2015/2016 on. The examination will be offered latest until summer term 2016 (repeaters only).

**Workload**

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

## M

## 5.89 Module: Marketing and Sales Management [M-WIWI-105312]

**Responsible:** Prof. Dr. Martin Klarmann

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each summer term	1 semester	German/English	4	1

Election block: Compulsory Elective Courses (at least 1 item)			
T-WIWI-107720	<a href="#">Market Research</a>	4,5 CR	Klarmann
T-WIWI-109864	<a href="#">Product and Innovation Management</a>	3 CR	Klarmann
Election block: Supplementary Courses (at most 1 item)			
T-WIWI-102834	<a href="#">Case Studies in Sales and Pricing</a>	1,5 CR	Klarmann
T-WIWI-106981	<a href="#">Digital Marketing and Sales in B2B</a>	1,5 CR	Konhäuser
T-WIWI-102835	<a href="#">Marketing Strategy Business Game</a>	1,5 CR	Klarmann
T-WIWI-102891	<a href="#">Price Negotiation and Sales Presentations</a>	1,5 CR	Klarmann, Schröder
T-WIWI-110920	<a href="#">Real World Lab: Innovation Communication</a>	1,5 CR	Klarmann

### 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. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

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

### Competence Goal

Students

- have an advanced knowledge about central marketing contents
- have a fundamental understanding of the marketing instruments
- know and understand several strategic concepts and how to implement them
- are able to implement their extensive marketing knowledge in a practical context
- know several qualitative and quantitative approaches to prepare decisions in Marketing
- have the theoretical knowledge to write a master thesis in Marketing
- have the theoretical knowledge to work in/together with the Marketing department

### Prerequisites

None

### Content

The aim of this module is to deepen central marketing contents in different areas.

### Annotation

Please note that only one of the listed 1,5-ECTS courses can be chosen in the module.

### Workload

The total workload for this module is approximately 270 hours.

## M

## 5.90 Module: Mathematical Programming [M-WIWI-101473]

**Responsible:** Prof. Dr. Oliver Stein

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

**Part of:** Economics and Management (Elective Modules in Economics and Management)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	4	6

Election block: Compulsory Elective Courses (at most 2 items)			
T-WIWI-102719	Mixed Integer Programming I	4,5 CR	Stein
T-WIWI-102726	Global Optimization I	4,5 CR	Stein
T-WIWI-103638	Global Optimization I and II	9 CR	Stein
T-WIWI-102856	Convex Analysis	4,5 CR	Stein
T-WIWI-102724	Nonlinear Optimization I	4,5 CR	Stein
T-WIWI-103637	Nonlinear Optimization I and II	9 CR	Stein
T-WIWI-102855	Parametric Optimization	4,5 CR	Stein
Election block: Supplementary Courses (at most 2 items)			
T-WIWI-106548	Advanced Stochastic Optimization	4,5 CR	Rebennack
T-WIWI-102720	Mixed Integer Programming II	4,5 CR	Stein
T-WIWI-102727	Global Optimization II	4,5 CR	Stein
T-WIWI-102723	Graph Theory and Advanced Location Models	4,5 CR	Nickel
T-WIWI-106549	Large-scale Optimization	4,5 CR	Rebennack
T-WIWI-103124	Multivariate Statistical Methods	4,5 CR	Grothe
T-WIWI-102725	Nonlinear Optimization II	4,5 CR	Stein
T-WIWI-102715	Operations Research in Supply Chain Management	4,5 CR	Nickel
T-WIWI-110162	Optimization Models and Applications	4,5 CR	Sudermann-Merx

### Competence Certificate

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

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

### Competence Goal

The student

- names and describes basic notions for advanced optimization methods, in particular from continuous and mixed integer programming,
- 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,
- identifies drawbacks of the solution methods and, if necessary, is able to make suggestions to adapt them to practical problems.

### Prerequisites

There is no compulsory course in the module.

### Content

The modul focuses on theoretical foundations as well as solution algorithms for optimization problems with continuous and mixed integer decision variables.

**Annotation**

The lectures are partly offered irregularly. The curriculum of the next three years is available online ([www.ior.kit.edu](http://www.ior.kit.edu)).

For the lectures of Prof. Stein a grade of 30 % of the exercise course has to be fulfilled. The description of the particular lectures is more detailed.

**Workload**

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

M

## 5.91 Module: Meshes and Point Clouds [M-INFO-100812]

**Responsible:** Prof. Dr. Hartmut Prautzsch  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

<b>Credits</b> 3	<b>Recurrence</b> Each term	<b>Duration</b> 1 term	<b>Language</b> German	<b>Level</b> 4	<b>Version</b> 1
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<b>Mandatory</b>			
T-INFO-101349	Meshes and Point Clouds	3 CR	Prautzsch



## M

## 5.92 Module: Microeconomic Theory [M-WIWI-101500]

**Responsible:** Prof. Dr. Clemens Puppe

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

Credits	Recurrence	Language	Level	Version
9	Each term	German/English	4	3

Election block: Compulsory Elective Courses (at least 9 credits)			
T-WIWI-102609	<a href="#">Advanced Topics in Economic Theory</a>	4,5 CR	Mitusch
T-WIWI-102861	<a href="#">Advanced Game Theory</a>	4,5 CR	Ehrhart, Puppe, Reiß
T-WIWI-102859	<a href="#">Social Choice Theory</a>	4,5 CR	Puppe
T-WIWI-102613	<a href="#">Auction Theory</a>	4,5 CR	Ehrhart
T-WIWI-105781	<a href="#">Incentives in Organizations</a>	4,5 CR	Nieken

### Competence Certificate

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

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

### Competence Goal

Students

- are able to model practical microeconomic problems mathematically and to analyze them with respect to positive and normative questions,
- understand individual incentives and social outcomes of different institutional designs.

An example of a positive question is: which regulation policy results in which firm decisions under imperfect competition? An example of a normative question is: which voting rule has appealing properties?

### Prerequisites

None

### Content

The student should gain an understanding of advanced topics in economic theory, game theory and welfare economics. Core topics are, among others, strategic interactions in markets, cooperative and non-cooperative bargaining (Advanced Game Theory), allocation under asymmetric information and general equilibrium over time (Advanced Topics in Economic Theory), voting and the aggregation of preferences and judgements (Social Choice Theory).

### Workload

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

## M

## 5.93 Module: Microservice-Based Web Applications [M-INFO-104061]

**Responsible:** Prof. Dr. Sebastian Abeck  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Language	Level	Version
8	Each summer term	German	4	1

Mandatory			
T-INFO-101271	Web Applications and Service-Oriented Architectures (II)	4 CR	Abeck
T-INFO-103121	Practical Course: Web Applications and Service-Oriented Architectures (II)	5 CR	Abeck

M

## 5.94 Module: Mobile Communication [M-INFO-100785]

**Responsible:** Prof. Dr. Oliver Waldhorst  
 Prof. Dr. Martina Zitterbart

**Organisation:** KIT Department of Informatics

**Part of:** [Informatics](#)

Credits	Recurrence	Duration	Language	Level	Version
4	Each winter term	1 term	German	4	1

Mandatory			
T-INFO-101322	<a href="#">Mobile Communication</a>	4 CR	Waldhorst, Zitterbart

M

## 5.95 Module: Models of Parallel Processing [M-INFO-100828]

**Responsible:** Thomas Worsch  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
5	Each summer term	1 term	German	4	1

Mandatory			
T-INFO-101365	<a href="#">Models of Parallel Processing</a>	5 CR	Worsch

**Recommendation**  
 Siehe Teilleistung

## M

## 5.96 Module: Module Master Thesis [M-WIWI-101656]

**Responsible:** Studiendekan der KIT-Fakultät für Informatik  
Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften

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

**Part of:** [Master Thesis](#)

Credits	Language	Level	Version
30	German	4	1

Mandatory			
T-WIWI-103142	<a href="#">Master Thesis</a>	30 CR	Studiendekan der KIT-Fakultät für Informatik, Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften

**Competence Certificate**

Examination by two examiners from the two faculties. For details refer to 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 handle a complex and unfamiliar subject based on scientific criteria and the current state of research.

He/she is in a position to critically analyze and structure the researched information as well as derive principles and regularities. He/she knows how to apply the thereby achieved results to solve the task at hand. Taking into account this knowledge and his/her interdisciplinary knowledge, he/she can draw own conclusions, derive improvement potentials, propose and implement science-based decisions.

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 sensibly structure a research paper, document results and clearly communicate the results in scientific form.

**Prerequisites**

Regulated in §11 of the examination regulation.

The requirements for the examiner are described in §14 (2) of the examination regulation.

## Content

- The master thesis shows that the candidate can autonomously investigate a problem from his discipline with scientific methods according to the state-of-the-art of the discipline within a specified time period.
- The master thesis can be written in German or English.
- The topic of a master thesis can be accepted or chosen by each of the examiners according to examination regulation. The examiner accepting a topic for a master thesis acts as the first supervisor of this thesis.
- Writing a master thesis with a supervisor who is not a member of the two faculties participating in the degree programme (Department of Informatics, Department of Economics and Management) requires acceptance by the examination board of the degree programme. The candidate must have an opportunity to make suggestions for the topic of the master thesis.
- Candidates can write a master thesis in teams. However, this requires that the contribution and performance of each candidate to the thesis is identifiable according to objective criteria which allow a unique delineation of each candidate's contribution. The contribution of each candidate regarded in isolation must fulfill the requirements a individual master thesis.
- In exceptional cases and upon request of the candidate, the chairman of the examination board chooses a supervisor and requests that this supervisor provides the candidate with a topic for the master thesis within 4 weeks after the request. In this case, the candidate is informed by the chairman of the examination board about the topic selected.
- Topic, specification of research tasks and the volume of the master thesis should be limited by the supervisor, so that the master thesis can be written with the assigned workload of 30 credits (750-900h).
- The master thesis must contain the following declaration of the candidate: "I truthfully assure that I have autonomously written this master thesis. I have quoted all sources used precisely and completely. I have labelled everything which has been taken from the work of others with or without change." A master thesis without this declaration will not be accepted.
- The date of the assignment of the topic to a candidate as well as the date of delivery of the master thesis should be registered at the examination board. The candidate can return a topic for the master thesis only one time and only within a period of two month after he has received the topic. Upon a request of the candidate with reasons supporting an extension, the examination board may extend the deadline for the delivery of the master thesis by a maximum of three months. A master thesis not delivered within time is graded as "fail" except when the candidate is not responsible for this delay (e.g. protection of motherhood).
- The master thesis is reviewed and graded by the supervisor and the additional examiner. The team of supervisor and examiner must represent both faculties participating in the degree programme (Department of Informatics, Department of Economics and Management). At least one of the two must be professor or junior professor. If the grades of the supervisor and the examiner differ, the examination board sets the mark within this limit.
- Reviewing and grading should be done within 8 weeks after delivery of the master thesis.

## Workload

The total workload for this module is approximately 900 hours. For further information see German version.

## M

**5.97 Module: Network Economics [M-WIWI-101406]****Responsible:** Prof. Dr. Kay Mitusch**Organisation:** KIT Department of Economics and Management**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

Credits	Recurrence	Language	Level	Version
9	Each term	German/English	4	2

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-100005	<a href="#">Competition in Networks</a>	4,5 CR	Mitusch
T-WIWI-100007	<a href="#">Transport Economics</a>	4,5 CR	Mitusch, Szimba
T-WIWI-102609	<a href="#">Advanced Topics in Economic Theory</a>	4,5 CR	Mitusch
T-WIWI-102712	<a href="#">Regulation Theory and Practice</a>	4,5 CR	Mitusch
T-WIWI-102713	<a href="#">Telecommunication and Internet Economics</a>	4,5 CR	Mitusch

**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 exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

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

**Competence Goal**

The students

- have acquired the basic knowledge for a future job in a network company or in a regulatory agency, ministry etc.
- recognize the specific characterizations of network sectors, know fundamental methods for an economic analysis of network sectors and recognize the interfaces for an interdisciplinary cooperation of economists, engineers and lawyers
- understand the interactions between infrastructures, control systems, and the users of networks, especially concerning their implications on investments, price setting and competitive behavior, and they can model or simulate exemplary applications
- can assess the necessity of regulation of natural monopolies and identify regulatory measures that are important for networks.

**Prerequisites**

None

**Content**

The module is concerned with network or infrastructure industries in the economy, e.g. telecommunication, traffic and energy sectors. These sectors are characterized by close interdependencies of operators and users of infrastructure as well as on states. States intervene in various forms, by the public and regulation authorities, due to the importance of network industries and due to limited abilities of markets to work properly in these industries. The students are supposed to develop a broad knowledge of these sectors and of the political options available.

**Recommendation**

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

**Workload**

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

M

**5.98 Module: Network Security: Architectures and Protocols [M-INFO-100782]**

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
4	Each summer term	1 term	German	4	1

Mandatory			
T-INFO-101319	<a href="#">Network Security: Architectures and Protocols</a>	4 CR	Zitterbart



## M

## 5.99 Module: Networking [M-INFO-101206]

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

**Credits**  
8

**Recurrence**  
Each term

**Duration**  
1 semester

**Level**  
4

**Version**  
4

Election block: Networking (at least 1 item as well as at least 8 credits)			
T-INFO-101321	<a href="#">Next Generation Internet</a>	4 CR	Bless, Zitterbart
T-INFO-101319	<a href="#">Network Security: Architectures and Protocols</a>	4 CR	Zitterbart
T-INFO-104386	<a href="#">Practical Course Protocol Engineering</a>	4 CR	Zitterbart
T-INFO-101338	<a href="#">Telematics</a>	6 CR	Zitterbart

**Competence Goal**

Each student should be able

- to learn and use the concepts and principals of wired network design
- to identify the flaws and benefits of wired communication systems
- to judge the performance of protocols, wired networks and architectures
- master advanced protocols, architectures and algorithms of wired communication systems

**Content**

This module details selected aspects of wired communication systems. This includes beside the requirements of secure and multimedia-based communication also the realization and controllability of large communication systems and networks. An important aspect is benchmarking and mastering the used algorithms, protocols and architectures. Also actual developments and applications are in the focus of this module.

## M

## 5.100 Module: Networking Labs [M-INFO-101204]

**Responsible:** Prof. Dr. Hannes Hartenstein  
Prof. Dr. Martina Zitterbart

**Organisation:** KIT Department of Informatics

**Part of:** Informatics

Credits	Recurrence	Duration	Level	Version
9	Each term	1 semester	4	2

Election block: Networking Labs (at least 1 item as well as at least 9 credits)			
T-INFO-101323	<a href="#">IT-Security Management for Networked Systems</a>	5 CR	Hartenstein
T-INFO-101319	<a href="#">Network Security: Architectures and Protocols</a>	4 CR	Zitterbart
T-INFO-106061	<a href="#">Access Control Systems: Foundations and Practice</a>	4 CR	Hartenstein

**Competence Goal**

Each student should be able

- to learn and apply the concepts and principals of wireless network design
- to identify the flaws and benefits of wireless communication systems
- to judge the performance of protocols, wireless networks and architectures
- master advanced protocols, architectures and algorithms of wireless communication systems

**Content**

This module details and applies selected aspects of communication systems. This includes beside the requirements of secure and multimedia-based communication also the realization and controllability of large communication systems and networks. An important aspect is benchmarking and mastering the used algorithms, protocols and architectures. Also actual developments and applications are in the focus of this module.

## M

## 5.101 Module: Networking Security - Theory and Praxis [M-INFO-101207]

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Level	Version
9	Each term	1 semester	4	1

Election block: Networking Security - Theory and Praxis (at least 1 item as well as at least 9 credits)			
T-INFO-101319	<a href="#">Network Security: Architectures and Protocols</a>	4 CR	Zitterbart
T-INFO-101323	<a href="#">IT-Security Management for Networked Systems</a>	5 CR	Hartenstein
T-INFO-101371	<a href="#">Security</a>	6 CR	Hofheinz, Müller-Quade
T-INFO-101390	<a href="#">Symmetric Encryption</a>	3 CR	Müller-Quade

**Competence Goal**

Each student should be able

- to recall the basic security mechanisms and theoretical foundations of networking security and cryptography
- to read and understand actual academic papers
- to judge the security level of actual security solutions
- to identify possible attacks on security solutions

**Prerequisites**

None

**Content**

This module details selected aspects of networking security and cryptography in theory and praxis.

## M

## 5.102 Module: Operations Research in Supply Chain Management [M-WIWI-102832]

**Responsible:** Prof. Dr. Stefan Nickel

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
7

Election block: Compulsory Elective Courses (at most 2 items)			
T-WIWI-102723	<a href="#">Graph Theory and Advanced Location Models</a>	4,5 CR	Nickel
T-WIWI-106200	<a href="#">Modeling and OR-Software: Advanced Topics</a>	4,5 CR	Nickel
T-WIWI-102715	<a href="#">Operations Research in Supply Chain Management</a>	4,5 CR	Nickel
Election block: Supplementary Courses (at most 2 items)			
T-WIWI-106546	<a href="#">Introduction to Stochastic Optimization</a>	4,5 CR	Rebennack
T-WIWI-102718	<a href="#">Discrete-Event Simulation in Production and Logistics</a>	4,5 CR	Nickel
T-WIWI-102719	<a href="#">Mixed Integer Programming I</a>	4,5 CR	Stein
T-WIWI-102720	<a href="#">Mixed Integer Programming II</a>	4,5 CR	Stein
T-WIWI-110162	<a href="#">Optimization Models and Applications</a>	4,5 CR	Sudermann-Merx
T-WIWI-106549	<a href="#">Large-scale Optimization</a>	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 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

- is familiar with basic concepts and terms of Supply Chain Management,
- knows the different areas of SCM and their respective optimization problems,
- is acquainted with classical location problem models (in planes, in 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

There is no compulsory course in the module.

### 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 SCM. On the one hand, the determination of optimal locations within a supply chain is addressed. Strategic decisions concerning the location of facilities as production plants, distribution centers or warehouses are of high importance for the rentability of Supply Chains. Thoroughly carried out, location planning tasks allow an efficient flow of materials and lead to lower costs and increased customer service. On the other hand, the planning of material transport in the context of supply chain management represents another focus of this module. By linking transport connections and different facilities, the material source (production plant) is connected with the material sink (customer). For given material flows or shipments, it is considered how to choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints. Furthermore, this module offers the possibility to learn about different aspects of the tactical and operational planning level in Supply Chain Management, including methods of scheduling as well as different approaches in procurement and distribution logistics. Finally, issues of warehousing and inventory management will be discussed.

**Recommendation**

Basic knowledge as conveyed in the module *Introduction to Operations Research* is assumed.

**Annotation**

Some lectures and courses are offered irregularly.

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

**Workload**

Total effort for 9 credits: ca. 270 hours

- Presence time: 84 hours
- Preparation/Wrap-up: 112 hours
- Examination and examination preparation: 74 hours

## M

## 5.103 Module: Optimization under Uncertainty in Information Engineering and Management [M-WIWI-103243]

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(mandatory\)](#)

Credits	Recurrence	Duration	Level	Version
5	Each winter term	1 semester	4	1

Mandatory			
T-WIWI-106545	<a href="#">Optimization under Uncertainty</a>	4,5 CR	Rebennack

### 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.

### Competence Goal

The students are familiar with the modern concepts of stochastic modeling and are in a position to describe and to analyse simple systems in an adequate way.

### Prerequisites

None

### Content

Markov chains are no longer a nice theory but an important tool in order to model, analyse, and optimize a stochastic system as it evolves over time.

Topics overview: Markov chains, Poisson Processes.

### Annotation

New module starting summer term 2017.

The planned lectures and courses for the next two years are announced online (<http://www.ior.kit.edu/>)

### Workload

See German version.

M

## 5.104 Module: Parallel Algorithms [M-INFO-100796]

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

Credits	Recurrence	Duration	Language	Level	Version
5	Each winter term	1 term	German	4	1

Mandatory			
T-INFO-101333	<a href="#">Parallel Algorithms</a>	5 CR	Sanders

M

**5.105 Module: Pattern Recognition [M-INFO-100825]**

**Responsible:** Prof. Dr.-Ing. Jürgen Beyerer  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

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

Mandatory			
T-INFO-101362	<a href="#">Pattern Recognition</a>	3 CR	Beyerer



**M****5.106 Module: Practical Course: Analysis of Complex Data Sets [M-INFO-102807]**

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

Credits	Recurrence	Language	Level	Version
4	Irregular	English	4	1

Mandatory			
T-INFO-105796	<a href="#">Practical Course: Analysis of Complex Data Sets</a>	4 CR	Böhm

M

## 5.107 Module: Practical Course: Analyzing Big Data [M-INFO-101663]

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

Credits	Recurrence	Language	Level	Version
6	Each summer term	German	4	2

Mandatory			
T-INFO-103202	<a href="#">Analyzing Big Data - Laboratory Course</a>	6 CR	Böhm

M

## 5.108 Module: Practical Course: Database Systems [M-INFO-101662]

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

Credits	Recurrence	Language	Level	Version
4	Each winter term	German	4	1

Mandatory			
T-INFO-103201	<a href="#">Practical Course: Database Systems</a>	4 CR	Böhm

**M****5.109 Module: Practical Course: Geometric Modeling [M-INFO-101666]**

**Responsible:** Prof. Dr. Hartmut Prautzsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [Informatics](#)

Credits	Recurrence	Language	Level	Version
3	Each winter term	German	4	1

Mandatory			
T-INFO-103207	<a href="#">Practical Course: Geometric Modeling</a>	3 CR	Prautzsch

M

## 5.110 Module: Practical Course: Implementation and Evaluation of Advanced Data Mining Approaches for Semi-Structured Data [M-INFO-103128]

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

<b>Credits</b> 4	<b>Recurrence</b> Irregular	<b>Language</b> English	<b>Level</b> 4	<b>Version</b> 1
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Mandatory			
T-INFO-106219	<a href="#">Practical Course: Implementation and Evaluation of Advanced Data Mining Approaches for Semi-Structured Data</a>	4 CR	Böhm

M

## 5.111 Module: Practical Course: Smart Data Analytics [M-INFO-103235]

**Responsible:** Prof. Dr.-Ing. Michael Beigl  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Language	Level	Version
6	Each summer term	German	4	1

Mandatory			
T-INFO-106426	Practical Course: Smart Data Analytics	6 CR	Beigl

## M

## 5.112 Module: Private Business Law [M-INFO-101216]

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

Credits	Recurrence	Language	Level	Version
9	Each term	German	4	3

Election block: Private Business Law (at least 1 item as well as at least 9 credits)			
T-INFO-101329	<a href="#">Employment Law I</a>	3 CR	Dreier
T-INFO-101330	<a href="#">Employment Law II</a>	3 CR	Dreier
T-INFO-101315	<a href="#">Tax Law I</a>	3 CR	Dreier
T-INFO-101314	<a href="#">Tax Law II</a>	3 CR	Dietrich, Dreier
T-INFO-101316	<a href="#">Law of Contracts</a>	3 CR	Dreier

**Competence Goal**

The student

- has gained in-depth knowledge of German company law, commercial law and civil law;
- is able to analyze, evaluate and solve complex legal and economic relations and problems;
- is well grounded in individual labour law, collective labour law and commercial constitutional law, evaluates and critically assesses clauses in labour contracts;
- recognizes the significance of the parties to collective labour agreements within the economic system and has differentiated knowledge of labour disputes law and the law governing the supply of temporary workers and of social law;
- possesses detailed knowledge of national earnings and corporate tax law and is able to deal with provisions of tax law in a scientific manner and assesses the effect of these provisions on corporate decision-making.

**Prerequisites**

None

**Content**

The module provides the student with knowledge in special matters in business law, like employment law, tax law and business law, which are essential for managerial decisions.

## M

## 5.113 Module: Public Business Law [M-INFO-101217]

**Responsible:** Dr. Tristan Barczak  
**Organisation:** KIT Department of Informatics  
**Part of:** Law

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German	4	3

Election block: Public Business Law (at least 1 item as well as at least 9 credits)			
T-INFO-101309	<a href="#">Telecommunications Law</a>	3 CR	Marsch
T-INFO-101303	<a href="#">Data Protection Law</a>	3 CR	Marsch
T-INFO-101311	<a href="#">Public Media Law</a>	3 CR	Dreier
T-INFO-101312	<a href="#">European and International Law</a>	3 CR	Brühann
T-INFO-101348	<a href="#">Environmental Law</a>	3 CR	Barczak

**Competence Certificate**

see course description.



M

## 5.114 Module: Randomized Algorithms [M-INFO-100794]

**Responsible:** Thomas Worsch  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
5	Each winter term	1 term	German	4	1

Mandatory			
T-INFO-101331	<a href="#">Randomized Algorithms</a>	5 CR	Worsch

M

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

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

Credits	Recurrence	Language	Level	Version
6	Each winter term	German	4	3

Mandatory			
T-INFO-108014	<a href="#">Robotics I - Introduction to Robotics</a>	6 CR	Asfour

## M

## 5.116 Module: Seminar Module Economic Sciences [M-WIWI-102736]

**Responsible:** Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften

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

**Part of:** [Research Course](#)

Credits	Language	Level	Version
3	German	4	1

Election block: Compulsory Elective Courses (1 item)			
T-WIWI-103474	<a href="#">Seminar in Business Administration A (Master)</a>	3 CR	Professorenschaft des Fachbereichs Betriebswirtschaftslehre
T-WIWI-103478	<a href="#">Seminar in Economics A (Master)</a>	3 CR	Professorenschaft des Fachbereichs Volkswirtschaftslehre
T-WIWI-103481	<a href="#">Seminar in Operations Research A (Master)</a>	3 CR	Nickel, Rebennack, Stein
T-WIWI-103483	<a href="#">Seminar in Statistics A (Master)</a>	3 CR	Grothe, Schienle

#### 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 published at 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

## 5.117 Module: Seminar Module Informatics [M-INFO-102822]

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

**Part of:** [Research Course](#)

Credits	Recurrence	Language	Level	Version
3	Each term	German/English	4	1

Election block: Compulsory Elective Seminar in Informatics (1 item)			
T-INFO-104336	<a href="#">Seminar Informatics A</a>	3 CR	Abeck
T-WIWI-103480	<a href="#">Seminar in Informatics B (Master)</a>	3 CR	Professorenschaft des Fachbereichs Informatik

M

**5.118 Module: Seminar Module Law [M-INFO-101218]**

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [Research Course](#)

Credits	Recurrence	Duration	Language	Level	Version
3	Each term	1 semester	German	4	1

Mandatory			
T-INFO-101997	<a href="#">Seminar: Legal Studies I</a>	3 CR	Dreier

M

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

**Responsible:** Prof. Dr.-Ing. Michael Beigl  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Language	Level	Version
3	Each term	German/English	4	1

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

## M

## 5.120 Module: Service Analytics [M-WIWI-101506]

**Responsible:** Prof. Dr. Gerhard Satzger  
Prof. Dr. Christof Weinhardt

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

Credits  
9Recurrence  
Each termLanguage  
GermanLevel  
4Version  
5

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-108715	<a href="#">Artificial Intelligence in Service Systems</a>	4,5 CR	Satzger
T-WIWI-105777	<a href="#">Business Intelligence Systems</a>	4,5 CR	Mädche, Nadj, Toreini
T-WIWI-102822	<a href="#">Industrial Services</a>	4,5 CR	Fromm
T-WIWI-102899	<a href="#">Modeling and Analyzing Consumer Behavior with R</a>	4,5 CR	Dorner, Weinhardt
T-WIWI-105778	<a href="#">Service Analytics A</a>	4,5 CR	Fromm
T-WIWI-109940	<a href="#">Special Topics in Information Systems</a>	4,5 CR	Weinhardt

**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**

Students

- knows the theoretical bases and the key components of Business Intelligence systems,
- acquires the basic skills to make use of business intelligence and analytics software in the service context
- are introduced into various application scenarios of analytics in the service context
- are able to distinguish different analytics methods and apply them in context
- learn how to apply analytics software in the service context
- are trained for the structured compilation and solution of practice relevant problems with the help of commercial business intelligence software packages as well as analytics methods and tools

**Prerequisites**

None

**Content**

The importance of services in modern economies is most evident – nearly 70% of gross value added are achieved in the tertiary sector and a growing number of industrial enterprises add customer specific services to their material goods or transform their business models fundamentally. The growing availability of data “Big Data” and their intelligent processing by applying analytic methods and business intelligence systems plays a key role.

It is the goal of the module to give students a comprehensive overview on the subject Business Intelligence & Analytics focusing on service issues. Various scenarios illustrate how the methods and systems introduced help to improve existing services or create innovative data-based services.

**Recommendation**

The course Service Analytics A [2595501] should be taken.

**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](http://www.ksri.kit.edu/teaching).

**Workload**

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

## M

## 5.121 Module: Service Design Thinking [M-WIWI-101503]

**Responsible:** Prof. Dr. Gerhard Satzger  
Prof. Dr. Christof Weinhardt

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	English	4	1

Mandatory			
T-WIWI-102849	<a href="#">Service Design Thinking</a>	12 CR	Satzger

**Competence Certificate**

The assessment is carried out as a general exam (according to Section 4(2), 3 of the examination regulation). The overall grade of the module is the grade of the examination (according to Section 4(2), 3 of the examination regulation).

**Competence Goal**

- Deep knowledge of the innovation method Design Thinking, as introduced and promoted by Stanford University
- Development of new, creative solutions through extensive observation of oneself and one's environment, in particular with regard to the relevant service users
- Know how to use prototyping and experimentation to visualize one's ideas, to test and iteratively develop them, and to converge on a solution
- Learn to apply the method to a real innovation projects issued by industry partners.

**Prerequisites**

None

**Content**

- Paper Bike: Learning about the basic method elements by building a paper bike that has to fulfill a given set of challenges. The bikes will be tested in a race during an international Kick-Off event with other universities of the SUGAR network (intern. Design Thinking network).
- Design Space Exploration: Exploring the problem space through customer and user observation as well as desk research.
- Critical Function Prototype: Identification of critical features from the customer's perspective that can contribute to the solution of the overarching problem. Building and testing prototypes that integrate these functionalities.
- Dark Horse Prototype: Inverting earlier assumptions and experiences, which leads to the inclusion of new features and solutions. Developing radically new ideas are in the focus of this phase.
- Funky Prototype: Integration of the individually tested and successful functions to several complete solution scenarios, which are further tested and developed.
- Functional Prototype: Selection of successful scenarios from the previous phase and building a higher resolution prototype. The final solution to the challenge is laid out in detail and tested with users.
- Final Prototype: Implementing the functional prototype and presenting it to the customer.

**Recommendation**

This course is held in English – proficiency in writing and communication is required.

Our past students recommend to take this course at the beginning of the masters program.

**Annotation**

Due to practical project work as a component of the program, access is limited.

The module (as well as the module component) spans two semesters. It starts in September every year and runs until end of June in the subsequent year. Entering the program is only possible at its beginning - after prior application in May/June.

For more information on the application process and the program itself are provided in the module component description and the program's website (<http://sdt-karlsruhe.de>).

Furthermore, the KSRI conducts an information event for applicants every year in May.

This module is part of the KSRI Teaching Program „Digital Service Systems“. For more information see the KSRI Teaching website: [www.ksri.kit.edu/teaching](http://www.ksri.kit.edu/teaching).



**Workload**

The total amount of work for this module is approx. 270 hours (9 credits). The workload for this course is comparably high as the course runs in cooperation with partner universities from around the world as well as partner companies. This causes overhead.

## M

## 5.122 Module: Service Economics and Management [M-WIWI-102754]

**Responsible:** Prof. Dr. Gerhard Satzger  
Prof. Dr. Christof Weinhardt

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

Credits  
9Recurrence  
Each termLanguage  
GermanLevel  
4Version  
3

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-110280	<a href="#">Digital Services: Business Models and Transformation</a>	4,5 CR	Satzger
T-WIWI-106201	<a href="#">Digital Transformation of Organizations</a>	4,5 CR	Mädche
T-WIWI-102640	<a href="#">Market Engineering: Information in Institutions</a>	4,5 CR	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 the scientific basics of the management of digital services and corresponding systems
- gain a comprehensive insight in the importance and the most important features of information systems as an central component of the digitalization of business processes, products and services
- know the most relevant concepts and theories to shape the digital transformation process of service systems successfully
- understand the OR methods in the sector of service management and apply them adequately
- are able to use large amounts of available data systematically for the planning, operation and improvement of complex service offers and to design and control information systems
- are able to develop market-oriented coordination mechanisms and apply service systems.

**Prerequisites**

None

**Content**

This module provides the foundation for the management of digital services and corresponding systems. The courses in this module cover the major concepts for a successful management of service systems and their digital transformation. Current examples from the research and practice enhance the relevance of the discussed topics.

**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](http://www.ksri.kit.edu/teaching).

**Workload**

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

## M

## 5.123 Module: Service Innovation, Design &amp; Engineering [M-WIWI-102806]

**Responsible:** Prof. Dr. Alexander Mädche  
Prof. Dr. Gerhard Satzger

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
3

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-110877	<a href="#">Engineering Interactive Systems</a>	4,5 CR	
T-WIWI-102639	<a href="#">Business Models in the Internet: Planning and Implementation</a>	4,5 CR	Weinhardt
T-WIWI-110887	<a href="#">Practical Seminar: Service Innovation</a>	4,5 CR	Satzger
T-WIWI-108437	<a href="#">Practical Seminar: Information Systems and Service Design</a>	4,5 CR	Mädche
T-WIWI-102641	<a href="#">Service Innovation</a>	4,5 CR	Satzger

### Competence Certificate

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

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

### Competence Goal

Students

- know about the challenges, concepts, methods and tools of service innovation management and are able to use them successfully.
- have a profound comprehension of the development and design of innovative services and are able to apply suitable methods and tools on concrete and specific issues.
- are able to embed the concepts of innovation management, development and design of services into organisations
- are aware of the strategic importance of services, are able to present value creation in the context of services systems and to strategically exploit the possibilities of their digital transformation
- elaborate concrete and problem-solving solutions for practical tasks in teams.

### Prerequisites

#### Dependencies between courses:

The course Practical Seminar Service Innovation cannot be applied in combination with the course Practical Seminar Digital Service Design.

### Content

This module is designed to constitute the basis for the development of successful ICT supported innovations thus including the methods and tools for innovation management, for the design and the development of digital services and the implementation of new business models. Current examples from science and practice enhance the relevance of the topics addressed.

### Recommendation

Attending the course Practical Seminar Service Innovation [2595477] is recommended in combination with the course Service Innovation [2595468].

Attending the course Practical Seminar Digital Service Design [new] is recommended in combination with the course Digital Service Design [new].

### 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](http://www.ksri.kit.edu/teaching).

### Workload

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

## M

## 5.124 Module: Service Management [M-WIWI-101448]

**Responsible:** Prof. Dr. Gerhard Satzger  
Prof. Dr. Christof Weinhardt

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)  
[Economics and Management \(Elective Modules in Business Administration\)](#)

Credits	Recurrence	Language	Level	Version
9	Each term	German/English	4	5

Mandatory			
T-WIWI-110280	<a href="#">Digital Services: Business Models and Transformation</a>	4,5 CR	Satzger
Election block: Supplementary Courses (4,5 credits)			
T-WIWI-108715	<a href="#">Artificial Intelligence in Service Systems</a>	4,5 CR	Satzger
T-WIWI-106201	<a href="#">Digital Transformation of Organizations</a>	4,5 CR	Mädche
T-WIWI-102822	<a href="#">Industrial Services</a>	4,5 CR	Fromm
T-WIWI-102899	<a href="#">Modeling and Analyzing Consumer Behavior with R</a>	4,5 CR	Dorner, Weinhardt
T-WIWI-105778	<a href="#">Service Analytics A</a>	4,5 CR	Fromm
T-WIWI-102641	<a href="#">Service Innovation</a>	4,5 CR	Satzger

**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

- understand the basics of developing and managing IT-based services,
- understand and apply OR methods in service management,
- systematically use vast amounts of available data for planning, operation, personalization and improvement of complex service offerings, and
- understand and analyze innovation processes in corporations.

**Prerequisites**

The course "Digital Services: Business Models and Transformation" is compulsory and must be examined.

**Content**

The module service management addresses the basics of developing and managing IT-based services. The lectures contained in this module teach the basics of developing and managing IT-based services and the application of OR methods in the field of service management. Moreover, students learn to systematically analyze vast amounts of data for planning, operation and improvement for complex service offerings. These tools enhance operational and strategic decision support and help to analyze and understand the overall innovation processes in corporations. Current examples from research and industry demonstrate the relevance of the topics discussed in this module.

**Recommendation**

None

**Workload**

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

## M

## 5.125 Module: Service Operations [M-WIWI-102805]

**Responsible:** Prof. Dr. Stefan Nickel

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

**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
6

Election block: Compulsory Elective Courses (at most 2 items)			
T-WIWI-102718	<a href="#">Discrete-Event Simulation in Production and Logistics</a>	4,5 CR	Nickel
T-WIWI-102884	<a href="#">Operations Research in Health Care Management</a>	4,5 CR	Nickel
T-WIWI-102715	<a href="#">Operations Research in Supply Chain Management</a>	4,5 CR	Nickel
T-WIWI-102716	<a href="#">Practical Seminar: Health Care Management (with Case Studies)</a>	4,5 CR	Nickel
Election block: Supplementary Courses (at most 2 items)			
T-WIWI-102872	<a href="#">Challenges in Supply Chain Management</a>	4,5 CR	Mohr

### 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

- knows the theoretical bases and the key components of Business Intelligence systems,
- acquires the basic skills to make use of business intelligence and analytics software in the service context
- are introduced into various application scenarios of analytics in the service context
- are able to distinguish different analytics methods and apply them in context
- learn how to apply analytics software in the service context
- are trained for the structured compilation and solution of practice relevant problems with the help of commercial business intelligence software packages as well as analytics methods and tools

### Prerequisites

There is no compulsory course in the module.

### Content

The importance of services in modern economies is most evident – nearly 70% of gross value added are achieved in the tertiary sector and a growing number of industrial enterprises add customer specific services to their material goods or transform their business models fundamentally. The growing availability of data “Big Data” and their intelligent processing by applying analytic methods and business intelligence systems plays a key role.

It is the goal of the module to give students a comprehensive overview on the subject Business Intelligence & Analytics focusing on service issues. Various scenarios illustrate how the methods and systems introduced help to improve existing services or create innovative data-based services.

### Recommendation

The course Practical Seminar Health Care should be combined with the course OR in Health Care Management.

### 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](http://www.ksri.kit.edu/teaching).

### Workload

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

## M

## 5.126 Module: Software Methods [M-INFO-101202]

**Responsible:** Prof. Dr. Ralf Reussner  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Level	Version
9	Each term	2 semester	4	4

Election block: Software Methods (at least 1 item as well as at least 9 credits)			
T-INFO-101381	<a href="#">Software Architecture and Quality</a>	3 CR	Reussner
T-INFO-101256	<a href="#">Software-Evolution</a>	3 CR	Reussner
T-INFO-101278	<a href="#">Model Driven Software Development</a>	3 CR	Reussner
T-INFO-101300	<a href="#">Requirements Engineering</a>	3 CR	Koziolek

**Competence Goal**

The students learn the foundations and advanced methods for systematic planning, design, implementation, evaluation and enhancement of software systems. By acquiring knowledge and capabilities to critically evaluate modern technologies, the students are enabled to use these technologies purposefully and effectively. Apart from functional viewpoints and software properties, extra-functional properties such as security and performance are taught. Additionally, an overview of current research topics and challenges are offered.

**Prerequisites**

None

**Content**

The content is explained in the course descriptions.

## M

## 5.127 Module: Software Systems [M-INFO-101201]

**Responsible:** Prof. Dr. Ralf Reussner  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Level	Version
9	Each term	2 semester	4	3

Election block: Software Systems (at least 1 item as well as at least 9 credits)			
T-INFO-101381	<a href="#">Software Architecture and Quality</a>	3 CR	Reussner
T-INFO-101256	<a href="#">Software-Evolution</a>	3 CR	Reussner
T-INFO-101278	<a href="#">Model Driven Software Development</a>	3 CR	Reussner
T-INFO-101281	<a href="#">Formal Systems II: Application</a>	5 CR	Beckert
T-INFO-101378	<a href="#">Formal Systems II: Theory</a>	5 CR	Beckert
T-INFO-101300	<a href="#">Requirements Engineering</a>	3 CR	Koziolek

**Competence Goal**

In the courses that comprise this module, students learn different approaches and techniques for systematic and high-quality development of software systems, e.g. requirements engineering, implementing components and services, use of parallelism and multi-core platforms, as well as the verification of created software systems.

**Prerequisites**

None

**Content**

The content will be explained in the course descriptions.

## M

## 5.128 Module: Stochastic Optimization [M-WIWI-103289]

**Responsible:** Prof. Dr. Steffen Rebennack

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

**Part of:** Economics and Management (Elective Modules in Economics and Management)

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Language**  
German/English

**Level**  
4

**Version**  
8

Election block: Compulsory Elective Courses (between 1 and 2 items)			
T-WIWI-106546	<a href="#">Introduction to Stochastic Optimization</a>	4,5 CR	Rebennack
T-WIWI-106548	<a href="#">Advanced Stochastic Optimization</a>	4,5 CR	Rebennack
T-WIWI-106549	<a href="#">Large-scale Optimization</a>	4,5 CR	Rebennack
Election block: Supplementary Courses (at most 1 item)			
T-WIWI-102723	<a href="#">Graph Theory and Advanced Location Models</a>	4,5 CR	Nickel
T-WIWI-102719	<a href="#">Mixed Integer Programming I</a>	4,5 CR	Stein
T-WIWI-102720	<a href="#">Mixed Integer Programming II</a>	4,5 CR	Stein
T-WIWI-103124	<a href="#">Multivariate Statistical Methods</a>	4,5 CR	Grothe
T-WIWI-102715	<a href="#">Operations Research in Supply Chain Management</a>	4,5 CR	Nickel
T-WIWI-106545	<a href="#">Optimization under Uncertainty</a>	4,5 CR	Rebennack
T-WIWI-110162	<a href="#">Optimization Models and Applications</a>	4,5 CR	Sudermann-Merx

### 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 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

- names and describes basic notions for advanced stochastic optimization methods, in particular, ways to algorithmically exploit the special model structures,
- knows the indispensable methods and models for quantitative analysis of stochastic optimization problems,
- models and classifies stochastic optimization problems and chooses the appropriate solution methods to solve also challenging stochastic optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions,
- identifies drawbacks of the solution methods and, if necessary, is able to make suggestions to adapt them to practical problems.

### Prerequisites

There is no compulsory course in the module.

### Content

The module focuses on the modeling as well as the imparting of theoretical principles and solution methods for optimization problems with special structure, which occur for example in the stochastic optimization.

### Recommendation

It is recommended to listen to the lecture "Introduction to Stochastic Optimization" before the lecture "Advanced Stochastic Optimization" is visited.

### Annotation

The course "Introduction to Stochastic Optimization" will be offered until the summer semester 2019 as an additional option in the elective offer of the module. Thereafter, the course can only be selected in the supplementary offer.

The courses are sometimes offered irregularly. 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

## 5.129 Module: Subdivision Algorithms [M-INFO-101864]

**Responsible:** Prof. Dr. Hartmut Prautzsch  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Language	Level	Version
5	Each summer term	German	4	1

Mandatory			
T-INFO-103550	Subdivision Algorithms	5 CR	Prautzsch

**Prerequisites**

None

M

## 5.130 Module: Telematics [M-INFO-100801]

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
6	Each winter term	1 term	German	4	1

Mandatory			
T-INFO-101338	Telematics	6 CR	Zitterbart

## M

**5.131 Module: Theory and Practice of Data Warehousing and Mining [M-INFO-101256]**

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Level**  
4

**Version**  
2

Election block: Practical Course (at most 1 item as well as at most 4 credits)			
T-INFO-103202	<a href="#">Analyzing Big Data - Laboratory Course</a>	6 CR	Böhm
T-INFO-105796	<a href="#">Practical Course: Analysis of Complex Data Sets</a>	4 CR	Böhm
T-INFO-106219	<a href="#">Practical Course: Implementation and Evaluation of Advanced Data Mining Approaches for Semi-Structured Data</a>	4 CR	Böhm
T-INFO-103201	<a href="#">Practical Course: Database Systems</a>	4 CR	Böhm
Election block: Lecture (at most 5 credits)			
T-INFO-101305	<a href="#">Big Data Analytics</a>	5 CR	Böhm
T-INFO-105742	<a href="#">Big Data Analytics 2</a>	3 CR	Böhm
T-INFO-101317	<a href="#">Deployment of Database Systems</a>	5 CR	Böhm
T-INFO-101306	<a href="#">Datamanagement in the Cloud</a>	5 CR	Böhm
T-INFO-108377	<a href="#">Data Privacy: From Anonymization to Access Control</a>	3 CR	Böhm

**Competence Goal**

The students

- know the research area of information systems in its various facets and are able to do scientific work in this area,
- are able to explain and to discuss complex aspects of the topics covered by this module with both experts and informed outsiders,
- know the concepts, algorithms, techniques and selected tools in the areas of data warehousing and data mining,
- are familiar with the practical challenges of data analysis and are able to develop respective solutions on their own.

**Prerequisites**

None

**Content**

This module aims at exposing students to modern information management, both, in 'breadth' and 'depth'. We achieve 'breadth' by means of a close inspection and comparison of different systems and their respective aims. We achieve 'depth' by means of an extensive examination of the underlying concepts and design alternatives, their assessment as well as by discussing applications. In particular, we look at data warehousing and mining techniques not only from a theoretical point of view but deploy and realise such technologies in a practical course.

**Annotation**

The courses of this module are offered irregularly. Nonetheless, it is guaranteed that the module can be passed anytime.

## M

**5.132 Module: Transport Infrastructure Policy and Regional Development [M-WIWI-101485]****Responsible:** Prof. Dr. Kay Mitusch**Organisation:** KIT Department of Economics and Management**Part of:** [Economics and Management \(Elective Modules in Economics and Management\)](#)**Credits**  
9**Recurrence**  
Each term**Duration**  
2 semester**Language**  
German/English**Level**  
4**Version**  
2

Election block: Compulsory Elective Courses (2 items)			
T-WIWI-103107	<a href="#">Spatial Economics</a>	4,5 CR	Ott
T-WIWI-100007	<a href="#">Transport Economics</a>	4,5 CR	Mitusch, Szimba

**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 exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately. The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Competence Goal**

The students

- understand the economic issues related to transport and regional development with a main focus on economic policy issues generated by the relationship of transport and regional development with the public sector
- are able to compare different considerations of politics, regulation and the private sector and to analyse and assess the respective decision problems both qualitatively and by applying appropriate methods from economic theory
- are prepared for careers in the public sector, particularly for public companies, politics, regulatory agencies, related consultancies, mayor construction companies or infrastructure project corporations

**Prerequisites**

None

**Content**

The development infrastructure (e.g. transport, energy, telecommunications) has always been one of the most relevant factors for economic development and particularly influences the development of the regional economy. From the repertoire of state actions, investments into transport infrastructure are often regarded the most important measure to foster regional economic growth. Besides the direct effects of transport policy on passenger and freight transport, a variety of individual economic activities is significantly dependent on the available or potential transport options. Decisions on the planning, financing and realization of mayor infrastructure projects require a solid and far-reaching consideration of direct and indirect growth effects with the occurring costs.

Through its combination of lectures the module reflects the complex interdependencies between infrastructure policy, transport industry and regional policy and provides its participants with a comprehensive understanding of the functionalities of one of the most important sectors of the economy and its relevance for economic policy.

**Annotation**

The courses *Assessment of Public Policies and Projects I* (winter term) and *Assessment of Public Policies and Projects II* (summer term) will no longer be part of this module. Student who have already had exams in this courses can integrate these exams in this module.

**Workload**

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

M

## 5.133 Module: Ubiquitous Computing [M-INFO-100789]

**Responsible:** Prof. Dr.-Ing. Michael Beigl  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
5	Each winter term	1 term	German/English	4	1

Mandatory			
T-INFO-101326	Ubiquitous Computing	5 CR	Beigl

## M

## 5.134 Module: Ubiquitous Computing [M-WIWI-101458]

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

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

**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German	4	3

Mandatory			
T-INFO-101326	<a href="#">Ubiquitous Computing</a>	5 CR	Beigl
Election block: Supplementary Courses (between 4 and 5 credits)			
T-WIWI-102761	<a href="#">Advanced Lab in Ubiquitous Computing</a>	4 CR	Beigl, Schmeck
T-INFO-101323	<a href="#">IT-Security Management for Networked Systems</a>	5 CR	Hartenstein

**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**

The student

- gets comprehensive knowledge about topics in the area of Ubiquitous Computing
- can design and evaluate ubiquitous systems in different application areas
- acquires appropriate knowledge for addressing specialized aspects in the area of ubiquitous computing

**Prerequisites**

See German version

**Content**

Ubiquitous information technology (Ubiquitous Computing) addresses the ubiquitous (or pervasive) availability of information processing. The availability of these systems has the objective to facilitate the operational environment in technical scenarios or in daily life of humans and to enrich it with new capabilities. This module provides fundamentals of ubiquitous computing and further topics like network and Internet technologies, security aspects, the analysis of autonomously operating systems in Organic Computing and also the utilisation of information and communication technologies in highly decentralized energy systems.

**Workload**

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

## M

## 5.135 Module: Wearable Robotic Technologies [M-INFO-103294]

**Responsible:** Prof. Dr.-Ing. Tamim Asfour  
Prof. Dr.-Ing. Michael Beigl

**Organisation:** KIT Department of Informatics

**Part of:** Informatics

Credits	Recurrence	Language	Level	Version
4	Each summer term	German/English	4	2

Mandatory			
T-INFO-106557	<a href="#">Wearable Robotic Technologies</a>	4 CR	Asfour, Beigl

**Competence Goal**

The students have received fundamental knowledge about wearable robotic technologies and understand the requirements for the design, the interface to the human body and the control of wearable robots. They are able to describe methods for modelling the human neuromusculoskeletal system, the mechatronic design, fabrication and composition of interfaces to the human body. The students understand the symbiotic human-machine interaction as a core topic of Anthropomatics and have knowledge of state of the art examples of exoskeletons, orthoses and prostheses.

**Content**

The lecture starts with an overview of wearable robot technologies (exoskeletons, prostheses and orthoses) and its potentials, followed by the basics of wearable robotics. In addition to different approaches to the design of wearable robots and their related actuator and sensor technology, the lecture focuses on modeling the neuromusculoskeletal system of the human body and the physical and cognitive human-robot interaction for tightly coupled hybrid human-robot systems. Examples of current research and various applications of lower, upper and full body exoskeletons as well as prostheses are presented.



## M

## 5.136 Module: Web and Data Science [M-WIWI-105368]

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	4	1

Election block: Compulsory Elective Courses (at least 2 items)			
T-WIWI-102666	Knowledge Discovery	4,5 CR	Sure-Vetter
T-WIWI-103112	Web Science	4,5 CR	Sure-Vetter
T-WIWI-110548	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**

The student

- know the basics of machine learning, data mining and knowledge discovery
- can design, train and evaluate systems that are capable of learning
- carry out knowledge discovery projects, taking into account algorithms, representations and applications.
- will look at current research topics in the field of Web Science and
- learn about the topics Small World Problem, Network Theory, Social Network Analysis, Bibliometrics, Link Analysis and Search,
- apply interdisciplinary thinking and
- apply technological approaches to social science problems.

**Prerequisites**

None

**Content**

The module focuses on machine learning and data mining methods for knowledge acquisition from large databases as well as web phenomena and the available technologies.

The lecture Knowledge Discovery gives an overview of approaches of machine learning and data mining for knowledge acquisition from large data sets. These are examined especially with respect to algorithms, applicability to different data representations and the use in real application scenarios.

Knowledge Discovery is an established research area with a large community that investigates methods for discovering patterns and regularities in large amounts of data, including unstructured text. A variety of methods exist to extract patterns and provide previously unknown insights. This information can be predictive or descriptive.

The lecture gives an overview of Knowledge Discovery. Specific techniques and methods, challenges and current and future research topics in this research area will be taught.

Contents of the lecture cover the entire machine learning and data mining process with topics on supervised and unsupervised learning and empirical evaluation. Covered learning methods range from classical approaches like decision trees, support vector machines and neural networks to selected approaches from current research. Learning problems considered include feature vector-based learning and text mining.

The lecture "Web Science" offers an insight into the analysis of social networks and the metrics used in this context. Thereby especially web phenomena and the available technologies.

Web Science is the emerging study of the people and technologies, applications, processes and practices that make the world Wide Web and are shaped and embossed. Web Science aims to develop theories, methods and findings from the entire academic disciplines and work with industry, business, politics and civil society to create an understanding of the Web: The largest socio-technical infrastructure in the history of mankind.

The lecture gives an introduction to the basic concepts of Web Science. Essential theoretical foundations, Phenomena and methods are presented and explained. This lecture aims to give students a basic knowledge and understanding of the structure and analysis of selected web phenomena and technologies. The topics include the small world problem, Network theory, social network analysis, graph-based search and technologies / standards / architectures.

**Workload**

The total workload for this module is approximately 270 hours.

## M

## 5.137 Module: Web Data Management [M-WIWI-101455]

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Informatics

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	4	4

Election block: Compulsory Elective Courses (2 items)			
T-WIWI-110848	Semantic Web Technologies	4,5 CR	Sure-Vetter
T-WIWI-103112	Web Science	4,5 CR	Sure-Vetter
T-WIWI-110548	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

- develop ontologies for semantic web technologies und choose suitable representation languages,
- are able to provide data and applications via a cloud-based infrastructure
- transfer the methods and technologies of semantic web technologies and cloud computing to new application sectors,
- evaluate the potential of semantic web technologies and the cloud computing approaches for new application sectors.

**Content**

The module Web Data Management covers the basic principles, methods and applications for intelligent systems in the World Wide Web. Cloud Services are essential for the decentralized, scalable provision of data and applications as well as the methods of semantic web based on the description of data and services via metadata in form of so called ontologies.

Formal principles and practical aspects such as knowledge modeling and available representation language tools for ontologies are covered in detail. Methods for the realization of intelligent systems within the World Wide Web are treated and applications as in Web 2.0 or Service Science are discussed and evaluated.

Furthermore the application of modern Cloud technologies for the use of software and hardware as a service via internet is introduced. Cloud technologies allow the efficient implementation of applications on distributed computer clusters and permit a high scalability as well as new business models in the internet.

**Workload**

The total workload for this module is approximately 270 hours (9 credits). The allocation is based on the credits of the courses of the module. The workload for courses with 4.5 credits is about 135 hours.

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

## M

## 5.138 Module: Wireless Networking [M-INFO-101203]

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

Credits	Recurrence	Duration	Level	Version
8	Each term	1 semester	4	2

Election block: Wireless Networking (at least 1 item as well as at least 8 credits)			
T-INFO-101337	<a href="#">Internet of Everything</a>	4 CR	Zitterbart
T-INFO-101322	<a href="#">Mobile Communication</a>	4 CR	Waldhorst, Zitterbart
T-INFO-101326	<a href="#">Ubiquitous Computing</a>	5 CR	Beigl
T-INFO-101319	<a href="#">Network Security: Architectures and Protocols</a>	4 CR	Zitterbart

**Competence Goal**

Each student should be able

- to learn and use the concepts and principals of wireless network design
- to identify the flaws and benefits of wireless communication systems
- to judge the performance of protocols, wireless networks and architectures
- master advanced protocols, architectures and algorithms of wireless communication systems

**Content**

This module details selected aspects of wireless communication systems. This includes beside the requirements of secure and multimedia-based communication also the realization and controllability of large communication systems and networks. An important aspect is benchmarking and mastering the used algorithms, protocols and architectures. Also actual developments and applications are in the focus of this module.

## 6 Courses

T

### 6.1 Course: A Closer Look at Social Innovation [T-WIWI-109932]

**Responsible:** Dr. Daniela Beyer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101507 - Innovation Management](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Irregular	1

Events					
SS 2020	2545105	<a href="#">Negotiating Open Innovation</a>	2 SWS	Seminar (S)	Beyer

#### Competence Certificate

Non exam assessment (following §4(2) 3 of the examination regulation). The grade consists of an innovation plan (comparable to an exposé) (15%), a guideline interview (25%), a presentation of the results (20%) and a seminar paper (40%).

#### Prerequisites

None

#### Recommendation

The previous attendance of the lecture Innovation Management is recommended.

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

V

### Negotiating Open Innovation

2545105, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

#### Content

In times of great challenges, it is no longer sufficient for individual experts to be responsible for innovation success. This is precisely why there is currently so much hype surrounding the topic of Open Innovation. The exchange of knowledge within and between organizations is crucial, but requires the right attitudes and decisions. This seminar examines how this can be achieved in the best possible way, depending on the objectives. By visiting two practitioners from science-economics cooperations and the company's own Startup Accelerator Programme, theory and practice are linked. Furthermore, a simulation game will take place in the last session, in which the learned will be applied. The grading is based on a group seminar work, which requires an empirical analysis and the preparation of this in the course of the semester (expose, preparation of the methodology) as well as well-informed participation.

## T

## 6.2 Course: Access Control Systems: Foundations and Practice [T-INFO-106061]

**Responsible:** Prof. Dr. Hannes Hartenstein  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101204 - Networking Labs](#)  
[M-INFO-101210 - Dynamic IT-Infrastructures](#)

Type	Credits	Recurrence	Version
Written examination	4	Each term	1

Events					
SS 2020	2400111	<a href="#">Access Control Systems: Foundations and Practice</a>	2 SWS	Lecture (V)	Hartenstein, Leinweber
Exams					
WS 19/20	7500278	<a href="#">Access Control Systems: Foundations and Practice</a>		Prüfung (PR)	Hartenstein

## T

## 6.3 Course: Advanced Empirical Asset Pricing [T-WIWI-110513]

**Responsible:** Jun.-Prof. Dr. Julian Thimme  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2530569	<a href="#">Advanced Empirical Asset Pricing</a>	2 SWS	Lecture (V)	Thimme
WS 19/20	2530570	<a href="#">Übung zu Advanced Empirical Asset Pricing</a>	1 SWS	Practice (Ü)	Thimme
Exams					
WS 19/20	7900319	<a href="#">Advanced Empirical Asset Pricing</a>		Prüfung (PR)	Thimme

**Competence Certificate**

The success control takes place in form of a written examination (60 min) during the semester break (according to §4(2), 1 SPO). If the number of participants is low, an oral examination (according to §4 (2), 2 SPO) may also be offered. 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 practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

**Recommendation**

We strongly recommend knowledge of the basic topics in investments (bachelor course), which will be necessary to be able to follow the course. In addition, prior participation in the Asset Pricing Master course is strongly recommended.

**Annotation**

New course from winter semester 2019/2020.

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

## V

**Advanced Empirical Asset Pricing**

2530569, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

In this course we will discuss the fundamentals of Asset Pricing and how to test them. Although this is an Empirical Asset Pricing course, we deal with some concepts from Asset Pricing Theory that we can test afterwards (CAPM, ICAPM, CCAPM, recursive utility). Besides, the course will cover the most important empirical methods to do so. For that purpose, we will discuss the overarching tool *Generalized Method of Moments*, and the special cases of OLS and FMB regressions. Every second week, we will meet for a programming session, in which we will look at the data to draw our own conclusions. An introduction to the software MATLAB will be given at the beginning of the course. Students should bring a laptop to these sessions. Programming skills are not required but helpful.

We start with a review of the Stochastic Discount Factor, which is already known from the course „Asset Pricing“. We then derive the CAPM and the Consumption-CAPM as special cases from the general consumption-savings optimization problem of the rational investor. In the first part of the course we discuss the CAPM and, as natural extensions, models with multiple factors. Prominent phenomena such as the value premium and momentum are discussed. In the second part of the lecture we will study extensions of Consumption-CAPM and study the implications of exotic preferences.

**Literature****Basisliteratur**

Asset pricing / Cochrane, J.H. - Rev. ed., Princeton Univ. Press, 2005.

**zur Vertiefung/ Wiederholung**

Investments and Portfolio Management / Bodie, Z., Kane, A., Marcus, A.J. - 9. ed., McGraw-Hill, 2011.

The econometrics of financial markets / Campbell, J.Y., Lo, A.W., MacKinlay, A.C. - 2. printing, with corrections, Princeton Univ. Press, 1997.



## T

## 6.4 Course: Advanced Game Theory [T-WIWI-102861]

**Responsible:** Prof. Dr. Karl-Martin Ehrhart  
 Prof. Dr. Clemens Puppe  
 Prof. Dr. Johannes Philipp Reiß

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

**Part of:** [M-WIWI-101453 - Applied Strategic Decisions](#)  
[M-WIWI-101500 - Microeconomic Theory](#)  
[M-WIWI-101502 - Economic Theory and its Application in Finance](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2521533	<a href="#">Advanced Game Theory</a>	2 SWS	Lecture (V)	Reiß
WS 19/20	2521534	<a href="#">Übung zu Advanced Game Theory</a>	1 SWS	Practice (Ü)	Reiß
Exams					
WS 19/20	7900279	<a href="#">Advanced Game Theory</a>		Prüfung (PR)	Puppe
WS 19/20	7900317	<a href="#">Advanced Game Theory</a>		Prüfung (PR)	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**

Basic knowledge of mathematics and statistics is assumed.

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

## V

**Advanced Game Theory**

2521533, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

## T

## 6.5 Course: Advanced Information Systems [T-WIWI-110373]

**Responsible:** Prof. Dr. Alexander Mädche  
Prof. Dr. Christof Weinhardt

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

**Part of:** [M-WIWI-101443 - Information Engineering and Management](#)

Type	Credits	Recurrence	Version
Written examination	5	Each winter term	1

Events					
WS 19/20	2540450	<a href="#">Advanced Information Systems</a>	2 SWS	Lecture (V)	Weinhardt, Mädche, Staudt
WS 19/20	2540451		1 SWS	Practice (Ü)	Mädche, Weinhardt
Exams					
WS 19/20	7900195	<a href="#">Advanced Information Systems</a>		Prüfung (PR)	Weinhardt
WS 19/20	7900231	<a href="#">Advanced Information Systems</a>		Prüfung (PR)	Weinhardt

**Competence Certificate**

Please note that the lecture will no longer be offered as of summer semester 2020. The last opportunity to take an examination is in the winter semester 2020/2021.

The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulation).

**Recommendation**

None

**Annotation**

The course starts with a short summary of Information Systems I and II. The course is held in English.

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

## V

**Advanced Information Systems**

2540450, WS 19/20, 2 SWS, Language: German/English, [Open in study portal](#)

Lecture (V)

**Literature**

- Shapiro, C., Varian, H., Information Rules: A Strategic Guide to the Network Economy. Harvard Business School Press 1999.
- Stahlknecht, P., Hasenkamp, U., Einführung in die Wirtschaftsinformatik. Springer Verlag 7. Auflage, 1999.
- Wirth, H., Electronic Business. Gabler Verlag 2001.

T

## 6.6 Course: Advanced Lab in Ubiquitous Computing [T-WIWI-102761]

**Responsible:** Prof. Dr.-Ing. Michael Beigl  
Prof. Dr. Hartmut Schmeck

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

**Part of:** [M-WIWI-101458 - Ubiquitous Computing](#)

Type	Credits	Recurrence	Version
Examination of another type	4	Irregular	1

### Competence Certificate

See German version

### Prerequisites

None

### Annotation

See German Version

## T

## 6.7 Course: Advanced Lab Informatics (Master) [T-WIWI-110548]

**Responsible:** Professorenschaft des Fachbereichs Informatik  
**Organisation:** KIT Department of Economics and Management  
**Part of:** M-WIWI-101455 - Web Data Management  
M-WIWI-101456 - Intelligent Systems and Services  
M-WIWI-101477 - Development of Business Information Systems  
M-WIWI-105366 - Artificial Intelligence  
M-WIWI-105368 - Web and Data Science

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each term	1

Events					
WS 19/20	2512301	Linked Data and the Semantic Web	3 SWS		Sure-Vetter, Acosta Deibe, Käfer, Heling
WS 19/20	2512501	Project lab Cognitive automobiles and robots	3 SWS	Practical course (P)	Zöllner
WS 19/20	2512600	Project lab Information Service Engineering	2 SWS	Practical course (P)	Sack
SS 2020	2512205	Lab Business Information Systems: Realisation of innovative services (Master)	3 SWS	Practical course (P)	Oberweis, Schiefer, Schüler, Toussaint
SS 2020	2512207	Lab Automation in Everyday Life (Master)	3 SWS	Practical course (P)	Oberweis, Forell, Frister
SS 2020	2512401	Development of Sociotechnical Information Systems (Master)	3 SWS	Practical course (P)	Sunyaev, Sturm
SS 2020	2512403	Praktikum Blockchain und Distributed Ledger Technology (Master)	SWS	Practical course (P)	Sunyaev, Beyene, Kannengießer, Pandl
SS 2020	2512500	Project Lab Machine Learning	3 SWS	Practical course (P)	Zöllner
SS 2020	2512555	Practical lab Security, Usability and Society (Master)	3 SWS	Practical course (P)	Volkamer, Strufe, Mayer, Mossano
Exams					
WS 19/20	7900038	Linked Data and the Semantic Web		Prüfung (PR)	Sure-Vetter
WS 19/20	7900046	Sicherheit		Prüfung (PR)	Volkamer
WS 19/20	7900047	Praktikum Betriebliche Informationssysteme: Realisierung innovativer Dienste		Prüfung (PR)	Oberweis
WS 19/20	7900102	Advanced Lab Information Service Engineering		Prüfung (PR)	Sack
WS 19/20	7900107	Advanced Lab Cognitive Automobile and Robots		Prüfung (PR)	Zöllner
WS 19/20	7900115	Development of Sociotechnical Information Systems		Prüfung (PR)	Sunyaev
WS 19/20	7900116	Advanced Lab Security, Usability and Society		Prüfung (PR)	Volkamer
WS 19/20	7900187	Real-World Challenges in Data Science und Analytics		Prüfung (PR)	Sure-Vetter
SS 2020	7900020	Lab Automation in Everyday Life (Master)		Prüfung (PR)	Oberweis
SS 2020	7900086	Project Lab Machine Learning		Prüfung (PR)	Zöllner
SS 2020	7900147	Cognitive Automobiles and Robots		Prüfung (PR)	Zöllner
SS 2020	7900148	Advanced Lab in Information Systems: Realization of innovative services (Master)		Prüfung (PR)	Oberweis
SS 2020	7900172	Lab Blockchain and Distributed Ledger Technology (Master)		Prüfung (PR)	Sunyaev

SS 2020	7900173	<a href="#">Development of Sociotechnical Information Systems (Master)</a>	Prüfung (PR)	Sunyaev
SS 2020	7900178	<a href="#">Practical lab Security, Usability and Society (Master)</a>	Prüfung (PR)	Volkamer

### 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:*



### Linked Data and the Semantic Web

2512301, WS 19/20, 3 SWS, Language: German/English, [Open in study portal](#)

### Content

Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this practical seminar is to build applications and devise algorithms that consume, provide, or analyse Linked Data.

The Linked Data principles are a set of practices for data publishing on the web. Linked Data builds on the web architecture and uses HTTP for data access, and RDF for describing data, thus aiming towards web-scale data integration. There is a vast amount of data available published according to those principles: recently, 4.5 billion facts have been counted with information about various domains, including music, movies, geography, natural sciences. Linked Data is also used to make web-pages machine-understandable, corresponding annotations are considered by the big search engine providers. On a smaller scale, devices on the Internet of Things can also be accessed using Linked Data which makes the unified processing of device data and data from the web easy.

In this practical seminar, students will build prototypical applications and devise algorithms that consume, provide, or analyse Linked Data. Those applications and algorithms can also extend existing applications ranging from databases to mobile apps.

For the seminar, programming skills or knowledge about web development tools/technologies are highly recommended. Basic knowledge of RDF and SPARQL are also recommended, but may be acquired during the seminar. Students will work in groups. Seminar meetings will take place as 'Block-Seminar'.

Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media

The exact dates and information for registration will be announced at the event page.



### Project lab Cognitive automobiles and robots

2512501, WS 19/20, 3 SWS, Language: German/English, [Open in study portal](#)

Practical course (P)

**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.

**Project lab Information Service Engineering**

2512600, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Practical course (P)

**Content**

The ISE project course is based on the summer semester lecture "Information Service Engineering". 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 ISE project 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
- M. Sc. Rima Türker
- M. Sc. Russa Biswas
- M. Sc. Fabian Hoppe
- M. Sc. Genet Asefa Gesese
- B. Sc. Tabea Tietz

**Lab Business Information Systems: Realisation of innovative services (Master)**

2512205, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

Practical course (P)

**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.

**Lab Automation in Everyday Life (Master)**2512207, SS 2020, 3 SWS, Language: German, [Open in study portal](#)**Practical course (P)****Content**

As part of the lab, various topics on everyday automation are offered. During the lab, the participants will gain an insight into problem-solving oriented project work and work on a project together in small groups.

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

**Development of Sociotechnical Information Systems (Master)**2512401, SS 2020, 3 SWS, Language: German/English, [Open in study portal](#)**Practical course (P)****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.

**Project Lab Machine Learning**2512500, SS 2020, 3 SWS, Language: German/English, [Open in study portal](#)**Practical course (P)****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.

**Practical lab Security, Usability and Society (Master)**2512555, SS 2020, 3 SWS, Language: German/English, [Open in study portal](#)**Practical course (P)**

**Content**

The internship "Security, Usability and Society" will cover topics both of usable security and privacy programming, and how to conduct user studies.

Important dates:

Kick-off: April 24th, 2020, 14: 00-15: 30 Get. 5.20 Room 3A-11.1

Final submission: TBA

Presentation: TBA

Subjects:

**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.

**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.

**Conducting Usable 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.

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](https://secuso.aifb.kit.edu/Studium_und_Lehre.php) .

As reported on the KIT informational page for the Corona outbreak ( <https://www.kit.edu/kit/25911.php> ), all teaching and in-person contact are forbid until new noticed. If the KIT restrictions are still in effect on the kick-off date, this will still take place at the date and time programmed, albeit in an online form.

In any case, we will inform you promptly as soon a more precise decision is reached.



T

## 6.8 Course: Advanced Lab User Studies in Security [T-WIWI-109271]

**Responsible:** Prof. Dr. Melanie Volkamer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-104520 - Human Factors in Security and Privacy](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	2

### 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

## T

## 6.9 Course: Advanced Machine Learning [T-WIWI-109921]

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
Dr. Abdolreza Nazemi

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

**Part of:** [M-WIWI-101470 - Data Science: Advanced CRM](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2540535	<a href="#">Advanced Machine Learning</a>	2 SWS	Lecture (V)	Nazemi
SS 2020	2540536	<a href="#">Exercise Advanced Machine Learning</a>	1 SWS	Practice (Ü)	Nazemi

**Competence Certificate**

Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.

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

**Prerequisites**

None

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

## V

**Advanced Machine Learning**

2540535, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

In recent years, the volume, variety, velocity, veracity, and variability of available data have increased due to improvements in computational and storage power. The rise of the Internet has made available large sets of data that allow us to use and merge them for different purposes. Data science helps us to extract knowledge from the continually-increasing large datasets. This course will introduce students to a wide range of machine learning and statistical techniques such as deep learning, LASSO, and support vector machine. You will get familiar with text mining, and the tools you need to analyze the various facets of data sets in practice. Students will learn theory and concepts with real data sets from different disciplines such as marketing, finance, and business.

**Tentative Course Outline:**

- Introduction
- Statistical Inference
- Shrinkage Methods
- Model Assessment and Selection
- Tree-based Machine Learning Algorithms
- Dimensionality Reduction
- Neural Networks and Deep Learning
- Natural Language Processing with Deep Learning
- Support Vector Machine

**Time of attendance**

- Attending the lecture: 13 x 90min = 19h 30m
- Attending the exercise classes: 7 x 90min = 10h 30m

**The student will learn**

- A wide range of machine learning algorithms and their weaknesses.
- The fundamental issues and challenges: data, high-dimension, train, model selection, etc.
- How to imply machine learning algorithms for real-world applications.
- The fundamentals of deep learning, main research activities, and on-going research in this field.

**Literature**

- Alpaydin, E. (2014). Introduction to Machine Learning. Third Edition, MIT Press.
- De Prado, M. L. (2018). Advances in Financial Machine Learning. John Wiley & Sons.
- Goodfellow, I., Bengio, Y., and A. Courville (2017). Deep Learning. MIT Press. (online available)
- Hastie, T., Tibshirani, R., and J. Friedman (2009). Elements of Statistical Learning. Second Edition. Springer. (online available)
- Leskovec, J., Rajaraman, A., Ullman, J. D., (2014). Mining of Massive Datasets. Cambridge University Press. (online available)
- Witten, I. H., Eibe, F., Hall, M. A., Pal, C. J. (2016). Data Mining: Practical Machine Learning Tools and Techniques. Morgan Kaufmann.

## T

## 6.10 Course: Advanced Management Accounting [T-WIWI-102885]

**Responsible:** Prof. Dr. Marcus Wouters  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101510 - Cross-Functional Management Accounting](#)

Type	Credits	Recurrence	Version
Oral examination	4,5	Each winter term	2

Events					
WS 19/20	2579907	<a href="#">Advanced Management Accounting</a>	4 SWS	Lecture (V)	Wouters, Riar
Exams					
WS 19/20	79-2579907-M	<a href="#">Advanced Management Accounting</a>		Prüfung (PR)	Wouters

**Competence Certificate**

The assessment consists of an oral exam (30 min) (according to §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.

**Recommendation**

The course requires significant prior knowledge of Management Accounting, similar to the content of the courses MA 1 and 2, although completion of these particular courses is not a formal requirement.

**Annotation**

This course is held in English. Lectures and tutorials are integrated.

The course is compulsory and must be examined.

Students who are interested in attending this course should send an e-mail to Professor Wouters ([marc.wouters@kit.edu](mailto:marc.wouters@kit.edu)).

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

## V

**Advanced Management Accounting**

2579907, WS 19/20, 4 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

This course is held in English. Students who are interested in attending this course should send an e-mail to Professor Wouters (marc.wouters@kit.edu).

**Inhalt:**

- The course addresses several topics where management accounting is strongly related to marketing, finance, or organization and strategy, such as customer value propositions, financial performance measures, managing new product development, and technology investment decisions.

**Learning objectives:**

- Students will be able to consider advanced management accounting methods in an interdisciplinary way and to apply these to managerial decision-making problems in operations and innovation.
- They will also be able to identify relevant research results on such methods.

**Examination:**

- The assessment consists of an oral exam (30 min) taking place in the recess period (according to § 4 (2) No. 2 of the examination regulation).
- The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Required prior Courses:**

- The course is compulsory and must be examined.

**Recommendations:**

- The course requires significant prior knowledge of Management Accounting, similar to the content of the courses MA 1 and 2, although completion of these particular courses is not a formal requirement.

**Workload:**

- The total workload for this course is approximately 135 hours. For further information see German version.

**Literature**

Literature is mostly made available via ILIAS.

T

**6.11 Course: Advanced Management Accounting 2 [T-WIWI-110179]**

**Responsible:** Prof. Dr. Marcus Wouters  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101510 - Cross-Functional Management Accounting](#)

Type	Credits	Recurrence	Version
Oral examination	4,5	Each summer term	1

Events					
SS 2020	2579908	<a href="#">Advanced Management Accounting 2</a>	4 SWS	Lecture / Practice (VÜ)	Wouters, Ebinger

**Competence Certificate**

The assessment consists of an oral exam (30 min) (according to §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.

**Recommendation**

The course requires significant prior knowledge of Management Accounting, similar to the content of the courses MA 1 and 2, although completion of these particular courses is not a formal requirement.

**Annotation**

This course is held in English. Lectures and tutorials are integrated.

Students who are interested in attending this course should send an e-mail to Professor Wouters ([marc.wouters@kit.edu](mailto:marc.wouters@kit.edu)).

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

V

**Advanced Management Accounting 2**

2579908, SS 2020, 4 SWS, Language: English, [Open in study portal](#)

Lecture / Practice (VÜ)

## T

## 6.12 Course: Advanced Statistics [T-WIWI-103123]

**Responsible:** Prof. Dr. Oliver Grothe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101637 - Analytics and Statistics](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2550552	<a href="#">Statistik für Fortgeschrittene</a>	2 SWS	Lecture (V)	Grothe
WS 19/20	2550553	<a href="#">Übung zu Statistik für Fortgeschrittene</a>	2 SWS	Practice (Ü)	Grothe, Kaplan
Exams					
WS 19/20	7900289	<a href="#">Advanced Statistics</a>		Prüfung (PR)	Grothe

**Competence Certificate**

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. A bonus program can improve the grade by one grade level (i.e. by 0.3 or 0.4). The exam is offered every semester. Re-examinations are offered only for repeaters.

**Prerequisites**

None

**Annotation**

New course starting winter term 2015/2016

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

## V

**Statistik für Fortgeschrittene**

2550552, WS 19/20, 2 SWS, [Open in study portal](#)

Lecture (V)

**Literature**

Skript zur Vorlesung

T

## 6.13 Course: Advanced Stochastic Optimization [T-WIWI-106548]

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Exams			
WS 19/20	7900245	<a href="#">Advanced Stochastic Optimization</a>	Prüfung (PR) Rebennack

### 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

## 6.14 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-101406 - Network Economics](#)  
[M-WIWI-101500 - Microeconomic Theory](#)  
[M-WIWI-101502 - Economic Theory and its Application in Finance](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Events					
SS 2020	2520527	<a href="#">Advanced Topics in Economic Theory</a>	2 SWS	Lecture (V)	Mitusch, Scheffel
SS 2020	2520528	<a href="#">Übung zu Advanced Topics in Economic Theory</a>	1 SWS	Practice (Ü)	Pegorari

**Competence Certificate**

The assessment consists of a written exam (60min) (following §4(2), 1 of the examination regulation) at the end of the lecture period or at the beginning of the following semester.

**Prerequisites**

None

**Recommendation**

This course is designed for advanced Master students with a strong interest in economic theory and mathematical models. Bachelor students who would like to participate are free to do so, but should be aware that the level is much more advanced than in other courses of their curriculum.

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

## V

**Advanced Topics in Economic Theory**

2520527, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**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

## 6.15 Course: Algorithm Engineering [T-INFO-101332]

**Responsible:** Prof. Dr. Peter Sanders  
Prof. Dr. Dorothea Wagner

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-100795 - Algorithm Engineering](#)  
[M-INFO-101199 - Advanced Algorithms: Design and Analysis](#)  
[M-INFO-101200 - Advanced Algorithms: Engineering and Applications](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each summer term	1

Events					
SS 2020	2400051	<a href="#">Algorithm Engineering</a>	2/1 SWS	Lecture (V)	Sanders, Schreiber

T

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

**Responsible:** Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101199 - Advanced Algorithms: Design and Analysis](#)  
[M-INFO-101200 - Advanced Algorithms: Engineering and Applications](#)  
[M-INFO-101237 - Algorithmic Methods for Hard Optimization Problems](#)

Type	Credits	Recurrence	Version
Oral examination	5	Irregular	1

T

**6.17 Course: Algorithmic Methods for Network Analysis [T-INFO-104759]**

**Responsible:** Dr. rer. nat. Torsten Ueckerdt  
Prof. Dr. Dorothea Wagner

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-102400 - Algorithmic Methods for Network Analysis](#)

Type	Credits	Recurrence	Version
Oral examination	5	Irregular	1

Events					
SS 2020	2400018	<a href="#">Algorithmic Methods for Network Analysis</a>	2+1 SWS	Lecture / Practice (VÜ)	Ueckerdt, Barth

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

V

**Algorithmic Methods for Network Analysis**

2400018, SS 2020, 2+1 SWS, Language: German, [Open in study portal](#)

**Lecture / Practice (VÜ)****Content**

150 h

**Literature**

Brandes, Erlebach: Network Analysis - Methodological Foundations. Springer, 2005.

Newman: Networks. An Introduction. Oxford University Press, 2010.

T

## 6.18 Course: Algorithms for Routing [T-INFO-100002]

**Responsible:** Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100031 - Algorithms for Routing](#)  
[M-INFO-101199 - Advanced Algorithms: Design and Analysis](#)  
[M-INFO-101200 - Advanced Algorithms: Engineering and Applications](#)

Type	Credits	Recurrence	Version
Written examination	5	Each summer term	1

Events					
SS 2020	24638	<a href="#">Algorithmen für Routenplanung (mit Übungen)</a>	3 SWS	Lecture / Practice (VÜ)	Buchhold, Zeitz, Zündorf, Sauer, Ueckerdt

T

## 6.19 Course: Algorithms for Visualization of Graphs [T-INFO-104390]

**Responsible:** Prof. Dr. Dorothea Wagner**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101199 - Advanced Algorithms: Design and Analysis](#)  
[M-INFO-101200 - Advanced Algorithms: Engineering and Applications](#)  
[M-INFO-102094 - Algorithms for Visualization of Graphs](#)

Type	Credits	Recurrence	Version
Oral examination	5	Irregular	1

Events					
WS 19/20	24118	<a href="#">Algorithmen zur Visualisierung von Graphen</a>	2+1 SWS	Lecture / Practice (VÜ)	Wagner, Mtsentlintze, Radermacher, Ueckerdt
Exams					
WS 19/20	7500046	<a href="#">Algorithms for Visualization of Graphs</a>		Prüfung (PR)	Wagner, Ueckerdt, Mtsentlintze

T

## 6.20 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	Credits	Recurrence	Version
Written examination	6	Each winter term	1

Events					
WS 19/20	24079	<a href="#">Algorithms II</a>	4 SWS	Lecture (V)	Sanders, Lamm, Heuer
Exams					
WS 19/20	7500245	<a href="#">Algorithms II</a>		Prüfung (PR)	Sanders

T

## 6.21 Course: Algorithms in Cellular Automata [T-INFO-101334]

**Responsible:** Thomas Worsch**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-100797 - Algorithms in Cellular Automata](#)  
[M-INFO-101199 - Advanced Algorithms: Design and Analysis](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each summer term	1

Events					
SS 2020	24622	<a href="#">Algorithms for Cellular Automata</a>	3 SWS	Lecture (V)	Worsch, Vollmar
Exams					
WS 19/20	75400001	<a href="#">Algorithms in Cellular Automata</a>		Prüfung (PR)	Worsch



T

## 6.22 Course: Analyzing and Evaluating Innovation Processes [T-WIWI-108774]

**Responsible:** Dr. Daniela Beyer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101507 - Innovation Management](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each winter term	1

Events					
WS 19/20	2545108	<a href="#">Innovation Processes Live</a>	2 SWS	Seminar (S)	Beyer

**Competence Certificate**

Non exam assessment (following §4(2) 3 of the examination regulation).

Innovation plan (exposé) (20%), Guided interviews/ quantitative survey (20%), presentation of results (20%), seminar paper (about 5 pages per person) (40%).

**Prerequisites**

None

**Recommendation**

Prior attendance of the course Innovation Management is recommended.

T

## 6.23 Course: Analyzing Big Data - Laboratory Course [T-INFO-103202]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101256 - Theory and Practice of Data Warehousing and Mining](#)  
[M-INFO-101663 - Practical Course: Analyzing Big Data](#)

Type	Credits	Recurrence	Version
Completed coursework (written)	6	Each summer term	3

Events					
SS 2020	24874	<a href="#">Analyzing Big Data Laboratory Course</a>	2 SWS	Practical course (P)	Böhm, Bach

T

**6.24 Course: Applied Econometrics [T-WIWI-103125]**

**Responsible:** Prof. Dr. Melanie Schienle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101638 - Econometrics and Statistics I](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Exams			
WS 19/20	7900251	<a href="#">Applied Econometrics</a>	Prüfung (PR) Krüger

**Competence Certificate**

The assessment of this course is a written examination (90 min) according to §4(2), 1 of the examination regulation.

**Prerequisites**

None

**Annotation**

The course is not offered regularly.

## T

## 6.25 Course: Artificial Intelligence in Service Systems [T-WIWI-108715]

**Responsible:** Prof. Dr. Gerhard Satzger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101448 - Service Management](#)  
[M-WIWI-101506 - Service Analytics](#)  
[M-WIWI-103117 - Data Science: Data-Driven Information Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2595650	<a href="#">Artificial Intelligence in Service Systems</a>	2 SWS	Lecture (V)	Kühl
Exams					
WS 19/20	7900331	<a href="#">Artificial Intelligence in Service Systems - oral</a>		Prüfung (PR)	Satzger

**Competence Certificate**

The assessment consists of a written exam (60 min). Successful completion of the exercises is a prerequisite for admission to the written exam.

**Prerequisites**

None

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

## V

**Artificial Intelligence in Service Systems**

2595650, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

Artificial Intelligence and the application of machine learning is becoming more and more popular to solve relevant business challenges. However, it is not only important to be familiar with precise algorithms, but rather a general understanding of the necessary steps with a holistic view—from real-world challenge to successful deployment of an AI. As part of this course, we teach the complete lifecycle of an AI project with a focus on supervised machine learning challenges. We do so by also teaching the use of Python and the required packages like scikit-learn and tensorflow with exemplary data. We then take this knowledge to the more complex case of service systems with different entities (e.g., companies) who interact with each other and show possibilities on how to derive holistic insights. Two possibilities to do so are the use of meta and transfer machine learning, where we teach insights in their theory, design and application.

Students of this course will be able to understand and implement the complete lifecycle of a typical Artificial Intelligence use case with supervised machine learning. Furthermore, they understand the importance and the means of applying AI and Machine Learning within service systems, which allows multiple, independent entities to collaborate and derive insights. Students will be proficient with typical Python code for AI challenges.

## T

## 6.26 Course: Asset Pricing [T-WIWI-102647]

**Responsible:** Prof. Dr. Martin Ruckes  
Prof. Dr. Marliese Uhrig-Homburg

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

**Part of:** [M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101482 - Finance 1](#)  
[M-WIWI-101483 - Finance 2](#)  
[M-WIWI-101502 - Economic Theory and its Application in Finance](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Events					
SS 2020	2530555	<a href="#">Asset Pricing</a>	2 SWS	Lecture (V)	Uhrig-Homburg, Thimme
SS 2020	2530556	<a href="#">Übung zu Asset Pricing</a>	1 SWS	Practice (Ü)	Uhrig-Homburg, Reichenbacher
Exams					
WS 19/20	7900056	<a href="#">Asset Pricing</a>		Prüfung (PR)	Uhrig-Homburg

**Competence Certificate**

The success control takes place in form of a written examination (75 min) during the semester break (according to §4(2), 1 SPO).

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 practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

**Prerequisites**

None

**Recommendation**

We strongly recommend knowledge of the basic topics in investments (bachelor course), which will be necessary to be able to follow the course.

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

## V

**Asset Pricing**

2530555, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature****Basisliteratur**

- Asset pricing / Cochrane, J.H. - Rev. ed., Princeton Univ. Press, 2005.

**Zur Wiederholung/Vertiefung**

- Investments and Portfolio Management / Bodie, Z., Kane, A., Marcus, A.J. - 9. ed., McGraw-Hill, 2011.
- The econometrics of financial markets / Campbell, J.Y., Lo, A.W., MacKinlay, A.C. - 2. printing, with corrections, Princeton Univ. Press, 1997.

## T

## 6.27 Course: Asymmetric Encryption Schemes [T-INFO-101260]

**Responsible:** Prof. Dr. Jörn Müller-Quade  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101198 - Advanced Topics in Cryptography](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each winter term	1

Events					
WS 19/20	24115	<a href="#">Asymmetric Encryption Schemes</a>	2 SWS	Lecture (V)	Müller-Quade
Exams					
WS 19/20	7500161	<a href="#">Asymmetric Encryption Schemes</a>		Prüfung (PR)	Geiselmann, Müller-Quade

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

## V

## Asymmetric Encryption Schemes

24115, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

## Content

This course presents the theoretical and practical aspects of Public Key Cryptography.

- The most important primitives of cryptography will be covered, as there are: one-way function, hash function, digital signature, public key encryption and digital signatures (RSA, ElGamal), and various methods of key exchange (e.g. Diffie-Hellman) with their strengths and weaknesses.
- In addition to public-key systems, the lecture provides knowledge about algorithms to solve number-theoretic problems on which the security of the systems is based. Thus the choice of parameters and the related level of security of a cryptographic system can be estimated.
- Furthermore, an introduction to provable security is provided, which presents some of the key security concepts (e.g. IND-CCA).
- The combination of cryptographic primitives will be treated on currently used protocols.

## Literature

- Skript zur Vorlesung, <http://iks.kit.edu/> (Zugangsdaten werden in der Vorlesung bekanntgegeben)

## Weiterführende Literatur

- M. Bishop, Introduction to Computer Security, Addison-Wesley, Boston, 2005.
- J. Buchmann, Introduction to Cryptography, Springer, Heidelberg, 2003.
- J.D. Lipson, Elements of Algebra and Algebraic Computing, Addison-Wesley, 1981.
- A.J. Menezes, P.C. van Oorschot, S.A. Vanstone Handbook of Applied Cryptography CRC Press, 1997.
- W. Stallings, Cryptography and Network Security, Prentice Hall, New Jersey, 1999.
- W. Trappe, L. Washington, Introduction to Cryptography with Coding Theory, Prentice Hall, New Jersey, 2002.

## T

## 6.28 Course: Auction Theory [T-WIWI-102613]

**Responsible:** Prof. Dr. Karl-Martin Ehrhart  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101446 - Market Engineering](#)  
[M-WIWI-101453 - Applied Strategic Decisions](#)  
[M-WIWI-101500 - Microeconomic Theory](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2520408	<a href="#">Auktionstheorie</a>	2 SWS	Lecture (V)	Ehrhart
WS 19/20	2520409	<a href="#">Übungen zu Auktionstheorie</a>	1 SWS	Practice (Ü)	Ehrhart
Exams					
WS 19/20	7900290	<a href="#">Auction Theory</a>		Prüfung (PR)	Ehrhart

**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

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

## V

**Auktionstheorie**

2520408, WS 19/20, 2 SWS, [Open in study portal](#)

Lecture (V)

**Literature**

- Ehrhart, K.-M. und S. Seifert: Auktionstheorie, Skript zur Vorlesung, KIT, 2011
- Krishna, V.: Auction Theory, Academic Press, Second Edition, 2010
- Milgrom, P.: Putting Auction Theory to Work, Cambridge University Press, 2004
- Ausubel, L.M. und P. Cramton: Demand Reduction and Inefficiency in Multi-Unit Auctions, University of Maryland, 1999

T

## 6.29 Course: Automated Planning and Scheduling [T-INFO-109085]

**Responsible:** Prof. Dr. Peter Sanders  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-104447 - Automated Planning and Scheduling](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each winter term	1

Events					
WS 19/20	2400026	<a href="#">Automated Planning and Scheduling</a>	2/1 SWS	Lecture / Practice (VÜ)	Balyo, Schreiber, Sanders
Exams					
WS 19/20	7500237	<a href="#">Automated Planning and Scheduling</a>		Prüfung (PR)	Sanders



## T

**6.30 Course: Automated Visual Inspection and Image Processing [T-INFO-101363]**

**Responsible:** Prof. Dr.-Ing. Jürgen Beyerer  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100826 - Automated Visual Inspection and Image Processing](#)  
[M-INFO-101239 - Machine Vision](#)

Type	Credits	Recurrence	Version
Written examination	6	Each winter term	2

Events					
WS 19/20	24169	<a href="#">Automated Visual Inspection and Image Processing</a>	4 SWS	Lecture (V)	Beyerer
Exams					
WS 19/20	7500008	<a href="#">Automated Visual Inspection and Image Processing</a>		Prüfung (PR)	Beyerer
SS 2020	7500003	<a href="#">Automated Visual Inspection and Image Processing</a>		Prüfung (PR)	Beyerer

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

## V

**Automated Visual Inspection and Image Processing**

24169, WS 19/20, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content****Topics covered:**

- sensors and concepts for image acquisition
- light and colour
- image signals (system theory, Fourier transformation, stochastic processes)
- excursion to wave optics
- pre-processing and image enhancement
- image restoration
- segmentation
- morphological image processing
- texture analysis
- detection
- image pyramids, multi scale analysis and wavelet-transform

**Educational objective:**

- Students have a sound knowledge regarding the basic concepts and methods of image processing (pre-processing and image enhancement, image restoration, image segmentation, morphological filtering, texture analysis, detection, image pyramids, multi-scale analysis and the wavelet transform)
- Students are in the position to work out and to evaluate solution concepts for problems of automated visual inspection
- Students have a sound knowledge of the different sensors and methods for the acquisition of image data as well as of the relevant optical principles
- Students know different concepts to describe image data and they know the essential system theoretical concepts and interrelations

**Literature****Weiterführende Literatur**

- R. C. Gonzalez und R. E. Woods, Digital Image Processing, Prentice-Hall, Englewood Cliffs, New Jersey, 2002
- B. Jähne, Digitale Bildverarbeitung, Springer, Berlin, 2002

T

**6.31 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-101511 - Advanced Topics in Public Finance](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	2

Events					
WS 19/20	2560134	<a href="#">Basics of German Company Tax Law and Tax Planning</a>	3 SWS	Lecture (V)	Wigger, Gutekunst

**Competence Certificate**

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

**Prerequisites**

None

**Recommendation**

Knowledge of the collection of public revenues is assumed. Therefore it is recommended to attend the course "Öffentliche Einnahmen" beforehand.

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

V

**Basics of German Company Tax Law and Tax Planning**

2560134, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content****Workload:**

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

T

## 6.32 Course: Big Data Analytics [T-INFO-101305]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100768 - Big Data Analytics](#)  
[M-INFO-101208 - Innovative Concepts of Data and Information Management](#)  
[M-INFO-101256 - Theory and Practice of Data Warehousing and Mining](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each winter term	1

Events					
WS 19/20	24114	<a href="#">Big Data Analytics</a>	3 SWS	Lecture (V)	Böhm
Exams					
WS 19/20	7500087	<a href="#">Big Data Analytics</a>		Prüfung (PR)	Böhm

T

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

**Responsible:** Prof. Dr.-Ing. Klemens Böhm**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101208 - Innovative Concepts of Data and Information Management](#)  
[M-INFO-101256 - Theory and Practice of Data Warehousing and Mining](#)  
[M-INFO-102773 - Big Data Analytics 2](#)**Type**  
Oral examination**Credits**  
3**Recurrence**  
Irregular**Version**  
1

Events					
SS 2020	2400042	<a href="#">Big Data Analytics 2</a>	2 SWS	Lecture (V)	Böhm
Exams					
WS 19/20	7500190	<a href="#">Big Data Analytics 2</a>		Prüfung (PR)	Böhm

**Prerequisites**

none

T

**6.34 Course: Biologically Inspired Robots [T-INFO-101351]**

**Responsible:** Prof. Dr.-Ing. Rüdiger Dillmann  
Arne Rönnau

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101251 - Autonomous Robotics](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each summer term	1

Events					
SS 2020	24619	<a href="#">Biologisch Motivierte Robotersysteme</a>	2 SWS	Lecture (V)	Rönnau
Exams					
WS 19/20	7500346	<a href="#">Biologically Inspired Robot</a>		Prüfung (PR)	Dillmann
SS 2020	7500237	<a href="#">Biologically Inspired Robot</a>		Prüfung (PR)	Dillmann

T

## 6.35 Course: Biometric Systems for Person Identification [T-INFO-101297]

**Responsible:** Prof. Dr.-Ing. Rainer Stiefelhagen

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101239 - Machine Vision](#)

Type	Credits	Version
Oral examination	3	1

Events					
SS 2020	2403011	<a href="#">Biometric Systems for Person Identification</a>	2 SWS	Lecture (V)	Sarfraz
Exams					
WS 19/20	7500043	<a href="#">Biometric Systems for Person Identification</a>		Prüfung (PR)	Stiefelhagen

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

V

### Biometric Systems for Person Identification

2403011, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

#### Content

Biometrics deals with the science of recognizing and identifying humans based on their biometrics traits, such as finger prints, face, iris, gait etc. With the increasing demands put on security and surveillance e.g. safer access control, border control/passports and identifying criminals /law enforcement, biometrics becomes more and more essential and technologies are being developed to solve many issues in this demanding area of research. In this course, the students will learn the fundamental concepts of underlying biometrics technologies, understanding of various techniques for different topics/technologies used in biometrics.

The topics include

- Introduction: Biometrics acquisitions and image processing, basic introduction to the area of computer vision/machine learning applied to biometrics
- Biometrics system: requirements, enrollment, identification/verification, performance metrics
- Biometrics technologies: Overview of different biometrics technologies
- Finger print recognition: image enhancement, state-of-the art techniques, challenges
- Iris recognition: image acquisitions, feature extraction, state-of-the-art techniques, challenges
- Face recognition: introduction, current methods, applications
- Palm print recognition: current methods
- Gait recognition: emerging methods
- Multi-Biometrics: multiple modes of biometrics, fusion strategies
- Risk analysis: attacks, liveness detection, fraud prevention

## T

## 6.36 Course: Blockchains &amp; Cryptofinance [T-WIWI-108880]

**Responsible:** Dr. Philipp Schuster  
Prof. Dr. Marliese Uhrig-Homburg

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

**Part of:** [M-WIWI-101409 - Electronic Markets](#)  
[M-WIWI-101446 - Market Engineering](#)  
[M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)  
[M-WIWI-101511 - Advanced Topics in Public Finance](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2530567	<a href="#">Blockchains &amp; Cryptofinance</a>	2 SWS	Lecture (V)	Schuster, Uhrig-Homburg
WS 19/20	2530568	<a href="#">Übung zu Blockchains &amp; Cryptofinance</a>	1 SWS	Practice (Ü)	Müller
Exams					
WS 19/20	7900028	<a href="#">Blockchains &amp; Cryptofinance</a>		Prüfung (PR)	Uhrig-Homburg

**Competence Certificate**

The assessment consists of a written exam (75 min) (§4(2), 1 of the examination regulations).

A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

New course starting winter term 2018/2019.

T

**6.37 Course: Building Intelligent and Robo-Advised Portfolios [T-WIWI-106442]**

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103247 - Intelligent Risk and Investment Advisory](#)

Type	Credits	Recurrence	Version
Written examination	9	Each summer term	1

**Competence Certificate**

The exam will be cancelled for the winter semester 2019/2020.

The exam tests the material of the current semester and takes place during the lecture-free period. Students who don't pass the exam are allowed to re-take the exam.

Details of the grade formation will be announced at the beginning of the event.

**Prerequisites**

None.

**Recommendation**

Good skills in applied math modeling (differential equations).

**Annotation**

The course is not offered regularly.



T

## 6.38 Course: Business Administration in Information Engineering and Management [T-WIWI-102886]

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101409 - Electronic Markets](#)  
[M-WIWI-101443 - Information Engineering and Management](#)

Type	Credits	Recurrence	Version
Written examination	5	Each summer term	1

### Competence Certificate

The lecture is no longer offered.

### Prerequisites

None

### Recommendation

Basic knowledge from Operations Research (linear programming) and from decision theory are expected.

## T

**6.39 Course: Business Data Analytics: Application and Tools [T-WIWI-109863]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103117 - Data Science: Data-Driven Information Systems](#)  
[M-WIWI-103118 - Data Science: Data-Driven User Modeling](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	2

Events					
SS 2020	2540466	<a href="#">Business Data Analytics: Application and Tools</a>	2 SWS	Lecture (V)	Dann, Staudt, Haubner
SS 2020	2540467	<a href="#">Excercise Business Data Analytics: Application and Tools</a>	1 SWS	Practice (Ü)	Jaquart

**Competence Certificate**

The assessment is carried out by a written examination (60 minutes) and a written elaboration. The scoring scheme for the overall evaluation will be announced at the beginning of the course.

**Prerequisites**

None

**Recommendation**

Knowledge of object-oriented programming and statistics is helpful.

**Annotation**

Course name until winter semester 2018/2019 "Applied Analytics with Open Source Tools" (T-WIWI-108438)

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

## V

**Business Data Analytics: Application and Tools**

2540466, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**6.40 Course: Business Data Strategy [T-WIWI-106187]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103117 - Data Science: Data-Driven Information Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2540484	<a href="#">Business Data Strategy</a>	2 SWS	Lecture (V)	Weinhardt
WS 19/20	2540485	<a href="#">Übung zu Business Data Strategy</a>	1 SWS	Practice (Ü)	Weinhardt, Knierim
Exams					
WS 19/20	7900226	<a href="#">Business data strategy</a>		Prüfung (PR)	Weinhardt
WS 19/20	7900234	<a href="#">Business Data Strategy</a>		Prüfung (PR)	Weinhardt

**Competence Certificate**

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation and an alternative exam assessment according to § 4 paragraph 2 Nr. 3 of the examination regulation. The grade is determined by 2/3 through the written exam and by 1/3 through the alternative exam assessment (e.g., presentation).

**Prerequisites**

None

**Recommendation**

Students should be familiar with basic concepts of business organisations, information systems, and programming. However, all material will be introduced, so no formal pre-conditions are applied.

**Annotation**

Limited number of participants.

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

**Business Data Strategy**

2540484, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Content**

With new methods for capturing and using different types of data and industry's recognition that society's use of data is less than optimal, the need for comprehensive strategies is more important than ever before. Advances in cybersecurity and information sharing and the use of data in its raw form for decision making all add to the complexity of integrated processes, ownership, stewardship, and sharing. The life cycle of data in its entirety spans the infrastructure, system design, development, integration, and implementation of information-enabling solutions. This lecture focuses on teaching about these dynamics and tools to comprehend and manage them in organisation contexts. Given the increasing size and complexity of data, methods for the transformation and structured preparation are an important tool in the process of sense-making. Modern software solutions and programming languages provide frameworks for such tasks that form another part of this course ranging from conceptual systems modelling to data manipulation to automated generation of HTML reports and web-applications.

T

**6.41 Course: Business Dynamics [T-WIWI-102762]**

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101409 - Electronic Markets](#)  
[M-WIWI-101470 - Data Science: Advanced CRM](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2540531	<a href="#">Business Dynamics</a>	2 SWS	Lecture (V)	Geyer-Schulz, Glenn
WS 19/20	2540532	<a href="#">Exercise Business Dynamics</a>	1 SWS	Practice (Ü)	Geyer-Schulz, Glenn
Exams					
WS 19/20	7979777	<a href="#">Business Dynamics</a>		Prüfung (PR)	Geyer-Schulz

**Competence Certificate**

Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.

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

**Prerequisites**

None

**Recommendation**

None

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

V

**Business Dynamics**2540531, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

John D. Sterman. Business Dynamics: Systems Thinking and Modeling for a Complex World. McGraw-Hill, 2000.

## T

## 6.42 Course: Business Intelligence Systems [T-WIWI-105777]

**Responsible:** Prof. Dr. Alexander Mädche  
Mario Nadj  
Peyman Toreini

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

**Part of:** [M-WIWI-101506 - Service Analytics](#)  
[M-WIWI-101510 - Cross-Functional Management Accounting](#)  
[M-WIWI-103117 - Data Science: Data-Driven Information Systems](#)  
[M-WIWI-104068 - Information Systems in Organizations](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each winter term	2

Events					
WS 19/20	2540422	<a href="#">Business Intelligence Systems</a>	3 SWS	Lecture (V)	Mädche, Nadj
Exams					
WS 19/20	7900224	<a href="#">Business Intelligence Systems</a>		Prüfung (PR)	Mädche

**Competence Certificate**

Alternative exam assessment. The assessment consists of a one-hour exam and the implementation of a Capstone project. Details will be announced at the beginning of the course.

**Prerequisites**

None

**Recommendation**

Basic knowledge on database systems is helpful.

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

## V

**Business Intelligence Systems**

2540422, WS 19/20, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Content

In most modern enterprises, Business Intelligence & Analytics (BI&A) Systems represent a core enabler of decision-making in that they are supplying up-to-date and accurate information about all relevant aspects of a company's planning and operations: from stock levels to sales volumes, from process cycle times to key indicators of corporate performance. Modern BI&A systems leverage beyond reporting and dashboards also advanced analytical functions. Thus, today they also play a major role in enabling data-driven products and services. The aim of this course is to introduce theoretical foundations, concepts, tools, and current practice of BI&A Systems from a managerial and technical perspective.

The course is complemented with an engineering capstone project, where students work in a team with real-world use cases and data in order to create running Business intelligence & Analytics system prototypes.

### Learning objectives

- Understand the theoretical foundations of key Business Intelligence & Analytics concepts supporting decision-making
- Explore key capabilities of state-of-the-art Business Intelligence & Analytics Systems
- Learn how to successfully implement and run Business Intelligence & Analytics Systems from multiple perspectives, e.g. architecture, data management, consumption, analytics
- Get hands-on experience by working with Business Intelligence & Analytics Systems with real-world use cases and data

### Prerequisites

This course is limited to a capacity of 50 places. The capacity limitation is due to the attractive format of the accompanying engineering capstone project. Strong analytic abilities and profound skills in SQL as well as Python and/or R are required. Students have to apply with their CV and transcript of records.

### Literature

- Turban, E., Aronson, J., Liang T.-P., Sharda, R. 2008. "Decision Support and Business Intelligence Systems".
- Watson, H. J. 2014. "Tutorial: Big Data Analytics: Concepts, Technologies, and Applications," *Communications of the Association for Information Systems* (34), p. 24.
- Arnott, D., and Pervan, G. 2014. "A critical analysis of decision support systems research revisited: The rise of design science," *Journal of Information Technology* (29:4), Nature Publishing Group, pp. 269–293 (doi: 10.1057/jit.2014.16).
- Carlo, V. (2009). "Business intelligence: data mining and optimization for decision making". Editorial John Wiley and Sons, 308-317.
- Chen, H., Chiang, R. H. L, and Storey, V. C. 2012. „Business Intelligence and Analytics: From Big Data to Big Impact,“ *MIS Quarterly* (36:4), pp. 1165-1188.
- Davenport, T. 2014. *Big Data @ Work*, Boston, MA: Harvard Business Review.
- Economist Intelligence Unit. 2015 "Big data evolution: Forging new corporate capabilities for the long term"
- Power, D. J. 2008. "Decision Support Systems: A Historical Overview," *Handbook on Decision Support Systems*, pp. 121–140 (doi: 10.1007/978-3-540-48713-5\_7).
- Sharma, R., Mithras, S., and Kankanhalli, A. 2014. „Transforming decision-making processes: a research agenda for understanding the impact of business analytics on organisations,“ *European Journal of Information Systems* (23:4), pp. 433-441.
- Silver, M. S. 1991. "Decisional Guidance for Computer-Based Decision Support," *MIS Quarterly* (15:1), pp. 105-122.

Further literature will be made available in the lecture.

T

## 6.43 Course: Business Models in the Internet: Planning and Implementation [T-WIWI-102639]

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101410 - Business & Service Engineering](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-102806 - Service Innovation, Design & Engineering](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	2

Events					
SS 2020	2540456	<a href="#">Internet Business Models</a>	2 SWS	Lecture (V)	Peukert, Dann, Dorner
SS 2020	2540457	<a href="#">Übungen zu Geschäftsmodelle im Internet: Planung und Umsetzung</a>	1 SWS	Practice (Ü)	Peukert, Dann
Exams					
WS 19/20	7900260	<a href="#">Business Models in the Internet: Planning and Implementation (Nachklausur aus dem SS19)</a>		Prüfung (PR)	Weinhardt

### Competence Certificate

Please note that in the summer semester 2020 the exam will only be offered to students who have completed the semester performance but have not yet taken the exam. From summer semester 2021 the exam will be offered again regularly.

Success is monitored through ongoing elaborations and presentations of tasks and a written exam (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.

Successful participation in the excercises is a prerequisite for admission to the written examination.

### Prerequisites

None

### Recommendation

None

### Annotation

Please note that the lecture will not be offered in summer semester 2020 due to the research semester of Prof. Weinhardt.

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

V

### Internet Business Models

2540456, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Literature

Wird in der Vorlesung bekannt gegeben.

## T

## 6.44 Course: Business Planning [T-WIWI-102865]

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Events					
WS 19/20	2545007	<a href="#">Business Planning for Founders (ENTECH)</a>	2 SWS	Seminar (S)	Wohlfeil, Bauman
SS 2020	2545007	<a href="#">Business Planning for Founders</a>	2 SWS	Seminar (S)	Kleinn, Mohammadi, Terzidis
Exams					
WS 19/20	7900023	<a href="#">Business Planning for Founders</a>		Prüfung (PR)	Terzidis
SS 2020	7900040	<a href="#">Business Planning</a>		Prüfung (PR)	Terzidis

**Competence Certificate**  
Alternative exam assessment.

**Prerequisites**  
None

**Recommendation**  
None

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

## V

**Business Planning for Founders (ENTECH)**

2545007, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**Content**

The seminar introduces students to the basic concepts of business planning for entrepreneurs. On the one hand, this involves concepts for the concretisation of business ideas (business modelling, market potential assessment, resource planning, etc.) and on the other hand, the preparation of an implementable business plan (with or without VC financing). In the course of the seminar, the students are familiarized with methods of further developing patents and business ideas into a more concrete business plan and formulating them in a business plan.

## V

**Business Planning for Founders**

2545007, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**Content**

The seminar introduces students to the basic concepts of business planning for entrepreneurs. On the one hand, this involves concepts for the concretisation of business ideas (business modelling, market potential assessment, resource planning, etc.) and on the other hand, the preparation of an implementable business plan (with or without VC financing). In the course of the seminar, the students are familiarized with methods of further developing patents and business ideas into a more concrete business plan and formulating them in a business plan.



T

## 6.45 Course: Business Planning for Founders - EUCOR [T-WIWI-110389]

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Irregular	1

Events					
WS 19/20	2545020	<a href="#">Business Planning for Founders (EUCOR Edition)</a>	2 SWS	Seminar (S)	Terzidis
Exams					
WS 19/20	7900274	<a href="#">Business Planning for Founders - EUCOR</a>		Prüfung (PR)	Terzidis

**Competence Certificate**

Alternative exam assessment.

**Prerequisites**

The course can only be combined with the course "International Selling - EUCOR" to be completed. The course is a combination of 6 ECTS, 3 ECTS per part. The combination can be credited either in the Entrepreneurship module or in the Sales Management module.

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

V

**Business Planning for Founders (EUCOR Edition)**2545020, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

### Content

The seminar introduces students to basic concepts of business planning for entrepreneurs. This involves concepts for the description of business opportunities (problem, solution, target group, value proposition etc.), the evaluation of the opportunity (market potential, competitor analysis, feasibility etc.) as well as the creation of an executable business plan (team set-up, product development, market entry approach, marketing approach, financial planning).

### Organizational Information:

- An application is required to participate in this event. The registration for the two courses "Business Planning for Founders - EUCOR" (3 ECTS) and "International Selling - EUCOR" (3 ECTS) is open now at [Wiwi-Portal](#).
- Please note that this course "Business Planning for Founders - EUCOR" (3 ECTS) and the course "[International Selling - EUCOR](#)" (3 ECTS) can only be taken together (a total of 6 ECTS). In combination with the compulsory lecture "[Entrepreneurship](#)" (3 ECTS) the module "Entrepreneurship" is completed (or in combination with "Sales Management and Retailing" (3 ECTS) the module "Sales Management").
- Both courses will be held in English.
- This event is also open to participants of the EUCOR programme.

Further information about the courses can be found in the module handbook (<https://www.wiwi.kit.edu/lehreMHB.php>) and in the course catalog:

[Business Planning for Founders](#)  
[International Selling](#)

If you have any questions, please contact the following persons:

Business Planning for Founders: [andreas.kleinn@kit.edu](mailto:andreas.kleinn@kit.edu)

International Selling: [anika.honold@kit.edu](mailto:anika.honold@kit.edu)

### Course Dates and Locations:

- Business Planning for Founders:  
 Wednesday, January 22, 2020, 1 pm - 6 pm  
 Thursday, January 23, 2020, 9 am - 1 pm  
 20.21, Raum 115
- International Selling:  
 Thursday, January 23, 2020, 2 pm - 7 pm  
 Friday, January 24, 2020, 10 am - 4 pm  
 20.21, Raum 115
- Both courses will be continued from March 18 to March 20, 2020 at the EM Strasbourg in France. Accommodation and travel expenses will be covered.

### Learning Objectives:

Students will be familiarized with methods of opportunity identification (including technology push opportunities), opportunity evaluation and business planning for a startup. In addition, they will work on a project in an international team and build the corresponding soft skills.

### Literature

Osterwalder, Alexander; Pigneur, Yves (2013): Business model generation. A handbook for visionaries, game changers, and challengers. New York: Wiley&Sons.

Aulet, Bill (2013): Disciplined Entrepreneurship. 24 Steps to a Successful Startup. Hoboken: Wiley.

Ulwick, Anthony W. (2016): Jobs to be done. Theory to practice: Idea Bite Press.

Terzidis, Orestis; Vogel, Leonid (2018): A Unified Model of the Technology Push Process and Its Application in a Workshop Setting. In André Presse, Orestis Terzidis (Eds.): Technology Entrepreneurship: Insights in New Technology-Based Firms, Research Spin-Offs and Corporate Environments. Cham: Springer International Publishing, pp. 111–135.

T

**6.46 Course: Business Strategies of Banks [T-WIWI-102626]**

**Responsible:** Prof. Dr. Wolfgang Müller  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2530299	<a href="#">Business Strategies of Banks</a>	2 SWS	Lecture (V)	Müller
Exams					
WS 19/20	7900064	<a href="#">Business Strategies of Banks</a>		Prüfung (PR)	Müller, Ruckes

**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 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**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

**6.47 Course: Case Studies in Sales and Pricing [T-WIWI-102834]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-105312 - Marketing and Sales Management](#)

Type	Credits	Recurrence	Version
Examination of another type	1,5	Each winter term	3

Events					
WS 19/20	2572182	<a href="#">Case Studies in Sales and Pricing</a>	1 SWS	Block (B)	Klarmann, Assistenten

**Competence Certificate**

Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015). The assessment consists of a group presentation with a subsequent round of questions totalling 30 minutes.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

Participation requires an application. The application period starts at the beginning of the semester. More information can be obtained on the website of the Marketing and Sales Research Group ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)). Access to this course is restricted. Typically all students will be granted the attendance of one course with 1.5 ECTS. Nevertheless attendance can not be guaranteed. For further information please contact Marketing and Sales Research Group ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)). Please note that only one of the 1.5-ECTS courses can be attended in this module.

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

## V

**Case Studies in Sales and Pricing**

2572182, WS 19/20, 1 SWS, Language: German/English, [Open in study portal](#)

**Block (B)**

**Content**

Students work in groups on case studies from the field of sales and pricing. The case studies contain quantitative calculations in the context of sales and pricing as well as tasks which are to be solved by logical reasoning. When solving the case studies, theoretical sales and pricing content is applied to practical problems. Finally, the results are presented by the group and discussed.

Students

- are able to work on a case study in the field of sales and pricing on their own
- are able to apply quantitative calculations on a case study in the field of sales and pricing
- are able to collect information and data beyond the case study description and make use of them for solving their tasks
- are able to apply theories from related lectures to a practical example
- are able to present their results in a structured and concise manner
- are able to organize their teamwork and collaborate in teams

Total work load for 1.5 ECTS: ca. 45 hours

- The final presentations can be held in German or English.
- In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in winter term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)) shortly before the lecture period in winter term starts.
- Please note that only one of the 1.5-ECTS courses can be chosen in the module.
- Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1,5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.

**Literature**

Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.

T

## 6.48 Course: Case Studies Seminar: Innovation Management [T-WIWI-102852]

**Responsible:** Prof. Dr. Marion Weissenberger-Eibl  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101507 - Innovation Management](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each winter term	1

Events					
WS 19/20	2545105	<a href="#">Case studies seminar: Innovation management</a>	2 SWS	Seminar (S)	Weissenberger-Eibl
Exams					
WS 19/20	7900237	<a href="#">Case Studies Seminar: Innovation Management</a>		Prüfung (PR)	Weissenberger-Eibl

### Competence Certificate

Alternative exam assessments (§4(2), 3 SPO).

### Prerequisites

None

### Recommendation

Prior attendance of the course Innovation Management is recommended.

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

V

### Case studies seminar: Innovation management

2545105, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

### Content

The objective of the seminar is to master selected concepts and methods of innovation management and then to apply these practically. Working in groups, the students apply the described concepts and methods of innovation management to a case study from the automotive industry to answer specific questions. Accordingly, the block seminar involves a switch from input to the application of this input. At the end, the results of the group work are presented in the form of a seminar paper and discussed by the whole course. A short introduction to presentation techniques is planned to help students prepare the seminar papers.

### Literature

Werden in der ersten Veranstaltung bekannt gegeben.

T

## 6.49 Course: Challenges in Supply Chain Management [T-WIWI-102872]

**Responsible:** Esther Mohr  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-102805 - Service Operations](#)  
[M-WIWI-102808 - Digital Service Systems in Industry](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	2

Events					
SS 2020	2550494	<a href="#">Challenges in Supply Chain Management</a>	3 SWS	Lecture (V)	Mohr

### Competence Certificate

The assessment consists of a written paper and an oral exam of ca. 30-40 min.

### Prerequisites

None

### Recommendation

Basic knowledge as conveyed in the module "Introduction to Operations Research" is assumed.

### Annotation

The number of course participants is limited to 12 participants due to joint work in BASF project teams. Due to these capacity restrictions, registration before course start is required. For further information see the webpage of the course.

The course is offered irregularly. 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

### Challenges in Supply Chain Management

2550494, SS 2020, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Content

The course consists of case studies of BASF which cover future challenges of supply chain management. Thus, the course aims at a case-study based presentation, critical evaluation and exemplary discussion of recent questions in supply chain management. The focus lies on future challenges and trends, also with regard to their applicability in practical cases (especially in the chemical industry).

The main part of the course is working on a project together with BASF in Ludwigshafen. 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 project topic.

This course will include working on cutting edge supply chain topics like Industry 4.0 / "Internet of Everything in production", supply chain analytics, risk management, procurement and production in SCM. The team essays / project reports will be linked to industry-related challenges as well as to upcoming theoretical concepts. The topics of the seminar will be announced at the beginning of the term in a preliminary meeting.

### Literature

Wird in Abhängigkeit vom Thema in den Projektteams bekanntgegeben.

T

## 6.50 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	Recurrence	Version
Written examination	6	Each summer term	1

Events					
SS 2020	24572	<a href="#">Kognitive Systeme</a>	4 SWS	Lecture / Practice (VÜ)	Waibel, Stüker, Meißner, Neumann
Exams					
WS 19/20	7500332	<a href="#">Cognitive Systems examination</a>		Prüfung (PR)	Waibel, Dillmann



T

## 6.51 Course: Competition in Networks [T-WIWI-100005]

**Responsible:** Prof. Dr. Kay Mitusch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101406 - Network Economics](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	3

Events					
WS 19/20	2561204	<a href="#">Competition in Networks</a>	2 SWS	Lecture (V)	Mitusch
WS 19/20	2561205	<a href="#">Übung zu Wettbewerb in Netzen</a>	1 SWS	Practice (Ü)	Wisotzky, Mitusch, Corbo
Exams					
WS 19/20	7900292	<a href="#">Competition in Networks</a>		Prüfung (PR)	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.

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

V

## Competition in Networks

2561204, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Literature

Literatur und Skripte werden in der Veranstaltung angegeben.

T

## 6.52 Course: Computational Complexity Theory, with a View Towards Cryptography [T-INFO-103014]

**Responsible:** Prof. Dr. Dennis Hofheinz  
Prof. Dr. Jörn Müller-Quade

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101575 - Computational Complexity Theory, with a View Towards Cryptography](#)

**Type**  
Oral examination

**Credits**  
6

**Recurrence**  
Irregular

**Version**  
1

Events					
WS 19/20	2400063	<a href="#">Computational Complexity Theory, with a View Towards Cryptography</a>	4 SWS	Lecture (V)	Hofheinz
Exams					
WS 19/20	7500092	<a href="#">Computational Complexity Theory, with a View Towards Cryptography</a>		Prüfung (PR)	Hofheinz

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

V

### Computational Complexity Theory, with a View Towards Cryptography

2400063, WS 19/20, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

T

**6.53 Course: Computational Geometry [T-INFO-104429]**

**Responsible:** Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-102110 - Computational Geometry](#)

Type	Credits	Recurrence	Version
Oral examination	5	Irregular	1

T

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

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-105032 - Data Science for Finance](#)

Type	Credits	Recurrence	Version
Written examination	6	Each winter term	3

Events					
WS 19/20	2500015	<a href="#">Computational Risk and Asset Management</a>	4 SWS	Lecture (V)	Ulrich
Exams					
WS 19/20	7900320	<a href="#">Computational Risk and Asset Management</a>		Prüfung (PR)	Ulrich

### Competence Certificate

The assessment consists of a written exam (90 minutes) according to §4(2) of the examination regulation.

### Recommendation

Good knowledge of statistics and first programming experience with Python is recommended.

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

V

### Computational Risk and Asset Management

2500015, WS 19/20, 4 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Content

The aim of this course is to master real-world challenges of computational risk and asset management and provide students with a skill set to incorporate different portfolio objectives into the investment process. It enables students to solve such challenges independently in Python.

The course covers several topics, among them:

Quantitative Portfolio Strategies: Extensions to Mean-Variance Portfolio Optimization

Return Densities: Forecasting with Traditional and Machine Learning Approaches, Monte Carlo Simulation

Financial Economics: Rationalizing Risk Premiums via Stochastic Discount Factor

Multi-Asset Valuation: DCF Approach, No-Arbitrage and Ito Calculus

The total workload for this course is approximately 180 hours.

Students will build up on the statistics and finance knowledge from their Bachelors program to learn about to automatize modern quant portfolio strategies. Students learn about advanced topics which are relevant for a realistic, real-world asset and risk management process.

T

**6.55 Course: Computational Risk and Asset Management I [T-WIWI-107032]**

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103247 - Intelligent Risk and Investment Advisory](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

**Competence Certificate**

The exam will be cancelled for the winter semester 2019/2020.

The grade consists of an exam and seven problem sets, which are distributed throughout the semester. All problem sets count equally and make up in total 25% of the final grade. The exam accounts for the remaining 75%. The exam is based on all the material that is taught in the current semester. The exam takes place in the last week of the lecture period. Students who fail the exam are allowed to retake the exam.

**Prerequisites**

None.

**Recommendation**

None

T

**6.56 Course: Computational Risk and Asset Management II [T-WIWI-106494]**

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103247 - Intelligent Risk and Investment Advisory](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

**Competence Certificate**

The exam will be cancelled for the winter semester 2019/2020.

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation and 6 problem sets, which are distributed throughout the semester. All problem sets count equally and make up in total 25% of the final grade. The exam accounts for the remaining 75%. The exam is based on all the material that is taught in the current semester. The exam takes place in the last week of the lecture period. Students who fail the exam are allowed to retake the exam.

**Prerequisites**

None.

**Recommendation**

It is recommend that students have studied the material of „Computational Risk and Asset Management I“.

## T

**6.57 Course: Computer Contract Law [T-INFO-102036]**

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101215 - Intellectual Property Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2411604	<a href="#">Computer Contract Law</a>	2 SWS	Lecture (V)	Bartsch
Exams					
WS 19/20	7500065	<a href="#">Computer Contract Law</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500066	<a href="#">Computer Contract Law</a>		Prüfung (PR)	Dreier, Matz

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

## V

**Computer Contract Law**

2411604, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The course deals with contracts from the following areas:

- Contracts of programming, licencing and maintaining software
- Contracts in the field of IT employment law
- IT projects and IT Outsourcing
- Internet Contracts

From these areas single contracts will be chosen and discussed (e.g. software maintenance, employment contract with a software engineer). Concerning the respective contract the technical features, the economic background and the subsumption in the national law of obligation (BGB-Schuldrecht) will be discussed. As a result different contractual clauses will be developed by the students. Afterwards typical contracts and conditions will be analysed with regard to their legitimacy as standard business terms (AGB). It is the aim to show the effects of the german law of standard business terms (AGB-Recht) and to point out that contracts are a means of drafting business concepts and market appearance.

It is the aim of this course to provide students with knowledge in the area of contract formation and formulation in practice that builds upon the knowledge the students have already acquired concerning the legal protection of computer programs. Students shall understand how the legal rules depend upon, and interact with, the economic background and the technical features of the subject. The contract drafts shall be prepared by the students and will be corporately completed during the lecture. It is the aim of the course that students will be able to formulate contracts by themselves.

**Literature**

- Langenfeld, Gerrit Vertragsgestaltung Verlag C.H.Beck, III. Aufl. 2004
- Heussen, Benno Handbuch Vertragsverhandlung und Vertragsmanagement Verlag C.H.Beck, II. Aufl. 2002
- Schneider, Jochen Handbuch des EDV-Rechts Verlag Dr. Otto Schmidt KG, III. Aufl. 2002

**Weiterführende Literatur**

Ergänzende Literatur wird in den Vorlesungsfolien angegeben.

## T

## 6.58 Course: Computer Vision for Human-Computer Interaction [T-INFO-101347]

**Responsible:** Prof. Dr.-Ing. Rainer Stiefelhagen

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101239 - Machine Vision](#)

Type	Credits	Recurrence	Version
Oral examination	6	Each winter term	1

Events					
WS 19/20	24180	<a href="#">Computer Vision for Human-Computer Interaction</a>	4 SWS	Lecture (V)	Stiefelhagen, Sarfraz
Exams					
WS 19/20	7500044	<a href="#">Computer Vision for Human-Computer Interaction</a>		Prüfung (PR)	Stiefelhagen
SS 2020	7500060	<a href="#">Computer Vision for Human-Computer Interaction</a>		Prüfung (PR)	Stiefelhagen

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

## V

## Computer Vision for Human-Computer Interaction

24180, WS 19/20, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

In this lecture current projects of the field of image processing will be presented which deal with the visual perception of persons re. human-computer interaction.

In respect of the individual topics we will discuss various methods and algorithms, their pros and cons and state of the art:

- Face detection and localisation
- Facial expression
- Assessment of head turns and viewing direction
- Person tracking and localisation
- Articulated body tracking
- Gesture recognition
- Audio-visual speech recognition
- Multi-camera environments
- Tools and libraries

The student acquires a basic understanding of computer vision topics within the context of human-computer interaction and learns how to apply them.

### Literature

#### Weiterführende Literatur

Wissenschaftliche Veröffentlichungen zum Thema, werden auf der VL-Website bereitgestellt.



## T

**6.59 Course: Consulting in Practice [T-INFO-101975]**

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101208 - Innovative Concepts of Data and Information Management](#)

Type	Credits	Recurrence	Version
Completed coursework	1,5	Irregular	1

Events					
WS 19/20	24664	<a href="#">Praxis der Unternehmensberatung</a>	2 SWS	Lecture (V)	Böhm, Lang
Exams					
WS 19/20	7500258	<a href="#">Consulting in Practice</a>		Prüfung (PR)	Böhm

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

## V

**Praxis der Unternehmensberatung**

24664, WS 19/20, 2 SWS, [Open in study portal](#)

Lecture (V)

**Content**

The market for consulting services 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 course 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` 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".

T

**6.60 Course: Context Sensitive Systems [T-INFO-107499]**

**Responsible:** Prof. Dr.-Ing. Michael Beigl  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100728 - Context Sensitive Systems](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each summer term	1

Events					
SS 2020	2400099	<a href="#">Context Sensitive Systems</a>	1 SWS	Practice (Ü)	Riedel
SS 2020	24658	<a href="#">Context Sensitive Systems</a>	2 SWS	Lecture (V)	Riedel, Beigl

T

**6.61 Course: Convex Analysis [T-WIWI-102856]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Exams				
WS 19/20	7900009_WS1920_HK	<a href="#">Convex Analysis</a>	Prüfung (PR)	Stein

**Competence Certificate**

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation.

The examination is held in the semester of the lecture and in the following semester.

Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

**Prerequisites**

None

**Recommendation**

It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

**Annotation**

The lecture is offered irregularly. The curriculum of the next three years is available online ([www.ior.kit.edu](http://www.ior.kit.edu)).

T

## 6.62 Course: Copyright [T-INFO-101308]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101215 - Intellectual Property Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
WS 19/20	24121	<a href="#">Copyright</a>	2 SWS	Lecture (V)	Dreier
Exams					
WS 19/20	7500064	<a href="#">Copyright</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500064	<a href="#">Copyright</a>		Prüfung (PR)	Dreier, Matz

T

## 6.63 Course: Corporate Compliance [T-INFO-101288]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101242 - Governance, Risk & Compliance](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2400087	<a href="#">Corporate Compliance</a>	2 SWS	Lecture (V)	Herzig
Exams					
WS 19/20	7500063	<a href="#">Corporate Compliance</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500063	<a href="#">Corporate Compliance</a>		Prüfung (PR)	Dreier, Matz

## T

## 6.64 Course: Corporate Financial Policy [T-WIWI-102622]

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101453 - Applied Strategic Decisions](#)  
[M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)  
[M-WIWI-101502 - Economic Theory and its Application in Finance](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2530214	<a href="#">Corporate Finance Policy</a>	2 SWS	Lecture (V)	Ruckes
SS 2020	2530215	<a href="#">Übungen zu Corporate Finance Policy</a>	1 SWS	Practice (Ü)	Ruckes, Hoang
Exams					
WS 19/20	7900058	<a href="#">Corporate Financial Policy</a>		Prüfung (PR)	Ruckes

**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

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

## V

**Corporate Finance Policy**

2530214, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature****Weiterführende Literatur**

Tirole, J. (2006): The Theory of Corporate Finance. Princeton University Press.

## T

## 6.65 Course: Corporate Risk Management [T-WIWI-109050]

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)  
[M-WIWI-101502 - Economic Theory and its Application in Finance](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Events					
WS 19/20	2530220		SWS	Practice (Ü)	Ruckes, Hoang, Silbereis
SS 2020	2530218	<a href="#">Corporate Risk Management</a>	SWS	Lecture (V)	Ruckes, Hoang
SS 2020	2530219	<a href="#">Übung zu Corporate Risk Management</a>	SWS	Practice (Ü)	Silbereis, Ruckes, Hoang
Exams					
WS 19/20	7900136	<a href="#">Corporate Risk Management</a>		Prüfung (PR)	Ruckes
SS 2020	7900259	<a href="#">Corporate Risk Management</a>		Prüfung (PR)	Ruckes

**Competence Certificate**

Please note that the lecture will not be offered in summer semester 2020.

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**

None

**Annotation**

The course will exceptionally be held in the winter semester 2019/2020. Usually, however, the event takes place as a block course in the summer semester.

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

## V

2530220, WS 19/20, SWS, Language: English, [Open in study portal](#)

Practice (Ü)

**Literature**

- Friberg, Richard. *Managing Risk and Uncertainty: A Strategic Approach*. Cambridge, MA: Managing Risk and Uncertainty, 2015.
- Stulz, René M. *Risk Management & Derivatives*. Mason, Ohio: Cengage Learning, Inc, 2002.
- Jorion, Philippe. *Value at Risk, 3rd Ed: The new Benchmark for Managing Financial Risk*. 3 ed. New York: General Finance & Investing, 2006.

## V

**Corporate Risk Management**

2530218, SS 2020, SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

- Friberg, Richard. *Managing Risk and Uncertainty: A Strategic Approach*. Cambridge, MA: Managing Risk and Uncertainty, 2015.
- Stulz, René M. *Risk Management & Derivatives*. Mason, Ohio: Cengage Learning, Inc, 2002.
- Jorion, Philippe. *Value at Risk, 3rd Ed: The new Benchmark for Managing Financial Risk*. 3 ed. New York: General Finance & Investing, 2006.

**Übung zu Corporate Risk Management**2530219, SS 2020, SWS, Language: English, [Open in study portal](#)**Practice (Ü)****Literature**

- Friberg, Richard. *Managing Risk and Uncertainty: A Strategic Approach*. Cambridge, MA: Managing Risk and Uncertainty, 2015.
- Stulz, René M. *Risk Management & Derivatives*. Mason, Ohio: Cengage Learning, Inc, 2002.
- Jorion, Philippe. *Value at Risk, 3rd Ed: The new Benchmark for Managing Financial Risk*. 3 ed. New York: General Finance & Investing, 2006.



T

**6.66 Course: Credit Risk [T-WIWI-102645]**

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2530565	Credit Risk	3 SWS	Lecture / Practice (VÜ)	Uhrig-Homburg, Mitarbeiter
Exams					
WS 19/20	7900055	Credit Risk		Prüfung (PR)	Uhrig-Homburg

**Competence Certificate**

The assessment consists of a written exam (75 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation. The examination is offered every semester and can be repeated at every regular examination date.

A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

**Prerequisites**

None

**Recommendation**

Knowledge from the course "Derivatives" is very helpful.

**Annotation**

See German version.

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

V

**Credit Risk**

2530565, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

**Content**

The lecture deals with the diverse issues arising in the context of measuring and controlling credit risk. At first, the theoretical and empirical relations between ratings, probabilities of default, and credit spreads are analysed. After that, the focus is on the valuation of credit risk. Finally, the management of credit risk, e.g. using credit derivatives and credit portfolio analysis, is examined, and the legal framework and its implications are discussed.

The objective of this course is to become familiar with the credit markets and the credit risk indicators like ratings, default probabilities and credit spreads. The students learn about the components of credit risk (e.g. default time and default rate) and quantify these in different theoretical models to price credit derivatives.

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

The assessment consists of a written exam following §4, Abs. 2, 1.

- Lando, D., Credit risk modeling: Theory and Applications, Princeton Univ. Press, (2004).
- Uhrig-Homburg, M., Fremdkapitalkosten, Bonitätsrisiken und optimale Kapitalstruktur, Beiträge zur betriebswirtschaftlichen Forschung 92, Gabler Verlag, (2001).

**Elective literature:**

- Bluhm, C., Overbeck, L., Wagner, C., Introduction to Credit Risk Modelling, 2nd Edition, Chapman & Hall, CRC Financial Mathematics Series, (2010).
- Duffie, D., Singleton, K.J., Credit Risk: Pricing, Measurement and Management, Princeton Series of Finance, Prentice Hall, (2003).

**Literature**

- Lando, D., Credit risk modeling: Theory and Applications, Princeton Univ. Press, (2004).
- Uhrig-Homburg, M., Fremdkapitalkosten, Bonitätsrisiken und optimale Kapitalstruktur, Beiträge zur betriebswirtschaftlichen Forschung 92, Gabler Verlag, (2001).

**Weiterführende Literatur:**

- Bluhm, C., Overbeck, L., Wagner, C. , Introduction to Credit Risk Modelling, 2nd Edition, Chapman & Hall, CRC Financial Mathematics Series, (2010).
- Duffie, D., Singleton, K.J., Credit Risk: Pricing, Measurement and Management, Princeton Series of Finance, Prentice Hall, (2003).

T

**6.67 Course: Critical Information Infrastructures [T-WIWI-109248]**

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-104403 - Critical Digital Infrastructures](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each winter term	4

Events					
WS 19/20	2511400	<a href="#">Critical Information Infrastructures</a>	2 SWS	Lecture (V)	Sunyaev, Dehling, Lins
WS 19/20	2511401	<a href="#">Exercises to Critical Information Infrastructures</a>	1 SWS	Practice (Ü)	Sunyaev, Dehling, Lins
Exams					
WS 19/20	7900067	<a href="#">Critical Information Infrastructures</a>		Prüfung (PR)	Sunyaev

**Competence Certificate**

The alternative exam assessment consists of

- the preparation of a written elaboration as well as
- an oral examination as part of a presentation of the work.

Details of the grades will be announced at the beginning of the course.

**Prerequisites**

None.

**Annotation**

New lecture from winter semester 2018/2019.

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

V

**Critical Information Infrastructures**

2511400, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

The course critical information infrastructures introduces students to the world of these complex sociotechnical systems that permeate societies on a global scale. Students will learn to handle the complexities involved in the design, development, operation and evaluation of critical information infrastructures. In the beginning of the lecture, critical information infrastructures will be introduced on a general level.

The following sessions will focus on an in-depth exploration of selected cases that represent current challenges in research and practice. Students will work (in a group) on a selected case and have to write a seminar paper.

There will be a short introduction to the topics for the course paper on the following topic areas. In addition, it will be possible to propose your own topics as a group in the topic areas:

- **Blockchain**
- **Cloud Computing**
- **Digital Health**
- **Fog Computing**
- **Information Privacy**
- **Certification of critical IT-Services**

In addition to introductions to the topics, an online course is also offered to introduce students to scientific writing. This means to learn how to quote, how a scientific work is structured, and in which form the results of one's research are presented. Since we offer topics in this course that also correspond to the research interests in our research group, there may also be the opportunity to work on the topics in more depth in the course of a final thesis. Students can choose a topic from a variety of topics of the topics presented, and write a course paper in a group of four students.

**Learning objectives:**

Students know concepts and technologies relevant for the design and reliable operation of critical information infrastructures and can leverage them to develop solutions for real-world challenges.

**Notes:**

Please note the changed course structure. The course will be held as a block course.

The number of participants is limited. Please register via the WiWi portal: <https://portal.wiwi.kit.edu/ys/3073>

Please make sure that you are available at the following dates if you would like to attend the course:

- Introduction: 4 dates on which you have to participate
  - 17.10.2019, 11.30 to 13.00: Foundations of Critical Information Infrastructures. (Geb. 05.20, R1C-02)
  - 24.10.2019, 11.30 to 13.00: Introduction to topics (Geb. 05.20, R1C-02)
  - 31.10.2019: 11.30 - 13.00: Socio-Technical/Socio-Material Information Systems & Design Science Research (Geb. 05.20, R1C-02)
  - 07.11.2019, 11.30 to 13.00: The Critical Information Infrastructures Landscape (Geb. 05.20, R1C-02)
- Intermediate presentations with compulsory attendance: 13.12.2019, 10am to 4pm (Geb. 05.20, R1C-02). Exact times will be announced later.
- Final presentations with compulsory attendance: 07.02.2020, 10am to 4pm (Geb. 05.20, R1C-02). Exact times will be announced later.
- Submission of the course paper: Expected on 02.02.2019. Final date will be announced in the course.

Further information on the course structure will be announced in the first session. Depending on the number of participants the individual sessions can have a shorter duration.

The meetings will take place at the Institute AIFB, KIT Campus South, Kollegiengebäude am Kronenplatz (Geb. 05.20) in Kaiserstr. 89.

The number of participants is limited to 24 students. The registration period is from 31.08.2019 to 29.09.2019. Participation slots are expected to be allocated on 01.10.2019 and must be accepted by the student by 06.10.2019. If the slot is not accepted, the free places will be offered to the students in the waiting list.

If you have any questions regarding this registration, please contact [sebastian.lins@kit.edu](mailto:sebastian.lins@kit.edu) or [dehling@kit.edu](mailto:dehling@kit.edu).

T

**6.68 Course: Cryptographic Voting Schemes [T-INFO-101279]**

**Responsible:** Prof. Dr. Jörn Müller-Quade  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101198 - Advanced Topics in Cryptography](#)

Type	Credits	Recurrence	Version
Oral examination	3	Irregular	1

T

**6.69 Course: Current Issues in Innovation Management [T-WIWI-102873]**

**Responsible:** Prof. Dr. Marion Weissenberger-Eibl  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101507 - Innovation Management](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Irregular	1

**Competence Certificate**

Non exam assessment (following §4(2) 3 of the examination regulation).

**Prerequisites**

None

**Recommendation**

None

**Annotation**

Please note that the seminars we offer vary from semester to semester. Information about the currently offered seminars can be found in the Wiwi-Portal and on the iTM Website.

T

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

**Responsible:** Prof. Dr. Bernhard Neumair  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101210 - Dynamic IT-Infrastructures](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each winter term	1

Events					
WS 19/20	24074	<a href="#">Data and Storage Management</a>	2 SWS	Lecture (V)	Neumair
Exams					
WS 19/20	7500112	<a href="#">Data and Storage Management</a>		Prüfung (PR)	Neumair

T

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

**Responsible:** Rheza Nakhaeizadeh  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101638 - Econometrics and Statistics I](#)  
[M-WIWI-101639 - Econometrics and Statistics II](#)

Type	Credits	Recurrence	Version
Oral examination	4,5	Each summer term	2

Events					
SS 2020	2520375	<a href="#">Data Mining and Applications</a>	2/4 SWS	Lecture (V)	Nakhaeizadeh

**Competence Certificate**

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

**Prerequisites**

None

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

V

**Data Mining and Applications**2520375, SS 2020, 2/4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**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



**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

## 6.72 Course: Data Privacy: From Anonymization to Access Control [T-INFO-108377]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101208 - Innovative Concepts of Data and Information Management](#)  
[M-INFO-101256 - Theory and Practice of Data Warehousing and Mining](#)  
[M-INFO-104045 - Data Privacy: From Anonymization to Access Control](#)

Type	Credits	Recurrence	Version
Written examination	3	Irregular	1

Events					
SS 2020	2400072	<a href="#">CANCELED! Data Privacy: From Anonymization to Access Control</a>	2 SWS		Buchmann

T

**6.73 Course: Data Protection by Design [T-INFO-108405]**

**Responsible:** PD Dr. Oliver Raabe  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101242 - Governance, Risk & Compliance](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	2

Events					
WS 19/20	2400052	<a href="#">Data protection by design</a>	2 SWS	Lecture (V)	Raabe, Werner
Exams					
WS 19/20	7500071	<a href="#">Data Protection by Design</a>		Prüfung (PR)	Raabe

T

## 6.74 Course: Data Protection Law [T-INFO-101303]

**Responsible:** Prof. Dr. Nikolaus Marsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101217 - Public Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	24018	<a href="#">Datenschutzrecht</a>	2 SWS	Lecture (V)	Barczak
Exams					
WS 19/20	7500162	<a href="#">Data Protection Law</a>		Prüfung (PR)	Barczak
SS 2020	7500083	<a href="#">Data Protection Law</a>		Prüfung (PR)	Eichenhofer

T

**6.75 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](#)

Type	Credits	Recurrence	Version
Written examination	4	Each summer term	1

Events					
SS 2020	24516	<a href="#">Datenbanksysteme</a>	2 SWS	Lecture (V)	Böhm, Mülle
SS 2020	24522	<a href="#">Übungen zu Datenbanksysteme</a>	1 SWS	Practice (Ü)	Böhm, Mülle
Exams					
WS 19/20	7500189	<a href="#">Database Systems</a>		Prüfung (PR)	Böhm

T

**6.76 Course: Database Systems and XML [T-WIWI-102661]**

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101456 - Intelligent Systems and Services](#)  
[M-WIWI-101477 - Development of Business Information Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	2

Events					
WS 19/20	2511202	<a href="#">Database Systems and XML</a>	2 SWS	Lecture (V)	Oberweis
WS 19/20	2511203	<a href="#">Exercises Database Systems and XML</a>	1 SWS	Practice (Ü)	Oberweis, Fritsch, Schüler
Exams					
WS 19/20	7900007	<a href="#">Database Systems and XML</a>		Prüfung (PR)	Oberweis
SS 2020	7900046	<a href="#">Database Systems and XML (Registration until 13 July 2020)</a>		Prüfung (PR)	Oberweis

**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

**Database Systems and XML**

2511202, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

Databases are a proven technology for managing large amounts of data. The oldest database model, the hierarchical model, was replaced by different models such as the relational or the object-oriented data model. The hierarchical model became particularly more important with the emergence of the extensible Markup Language XML. XML is a data format for structured, semi-structured, and unstructured data. In order to store XML documents consistently and reliably, databases or extensions of existing data base systems are required. Among other things, this lecture covers the data model of XML, concepts of XML query languages, aspects of storage of XML documents, and XML-oriented database systems.

**Learning objectives:**

Students

- know the basics of XML and generate XML documents,
- are able to use XML database systems and to formulate queries to XML documents,
- know to assess the use of XML in operational practice in different application contexts.

**Workload:**

- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h

**Literature**

- M. Klettke, H. Meyer: XML & Datenbanken: Konzepte, Sprachen und Systeme. dpunkt.verlag 2003
- H. Schöning: XML und Datenbanken: Konzepte und Systeme. Carl Hanser Verlag 2003
- W. Kazakos, A. Schmidt, P. Tomchyk: Datenbanken und XML. Springer-Verlag 2002
- R. Elmasri, S. B. Navathe: Grundlagen der Datenbanksysteme. 2009
- G. Vossen: Datenbankmodelle, Datenbanksprachen und Datenbankmanagementsysteme. Oldenbourg 2008

Weitere Literatur wird in der Vorlesung bekannt gegeben.

T

**6.77 Course: Datamanagement in the Cloud [T-INFO-101306]**

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100769 - Datamanagement in the Cloud](#)  
[M-INFO-101208 - Innovative Concepts of Data and Information Management](#)  
[M-INFO-101256 - Theory and Practice of Data Warehousing and Mining](#)

Type	Credits	Recurrence	Version
Oral examination	5	Irregular	1

**Prerequisites**

none



T

## 6.78 Course: Deep Learning and Neural Networks [T-INFO-109124]

**Responsible:** Prof. Dr. Alexander Waibel  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-104460 - Deep Learning and Neural Networks](#)

Type	Credits	Recurrence	Version
Written examination	6	Each summer term	1

Events					
SS 2020	2400024	<a href="#">Deep Learning and Neural Networks</a>	4 SWS	Lecture (V)	Waibel, Pham
Exams					
WS 19/20	7500259	<a href="#">Deep Learning and Neural Networks</a>		Prüfung (PR)	Waibel

T

## 6.79 Course: Deep Learning for Computer Vision [T-INFO-109796]

**Responsible:** Prof. Dr.-Ing. Rainer Stiefelhagen

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101239 - Machine Vision](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	24628	<a href="#">Deep Learning for Computer Vision</a>	2 SWS	Lecture (V)	Stiefelhagen, Sarfraz
Exams					
WS 19/20	7500045	<a href="#">Content-based Image and Video Retrieval</a>		Prüfung (PR)	Stiefelhagen
SS 2020	7500024	<a href="#">Deep Learning for Computer Vision</a>		Prüfung (PR)	Stiefelhagen

### Recommendation

Basic knowledge of pattern recognition as taught in the module Cognitive Systems, is expected.

### Annotation

The course is partially given in German and English.

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

V

## Deep Learning for Computer Vision

24628, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

In recent years tremendous progress has been made in analysing and understanding image and video content. The dominant approach in Computer Vision today are deep learning approaches, in particular the usage of Convolutional Neural Networks.

The lecture introduces the basics, as well as advanced aspects of deep learning methods and their application for a number of computer vision tasks. The following topics will be addressed in the lecture:

- Introduction to Deep Learning
- Convolutional Neural Networks (CNN): Background
- CNNs: basic architectures and learning algorithms
- Object Recognition with CNN
- Image Segmentation with CNN
- Recurrent Neural Networks
- Generating image descriptions (Image Captioning)
- Automatic question answering (Visual Question Answering)
- Generative Adversarial Networks (GAN) and their applications
- Deep Learning platforms and tools

T

**6.80 Course: Deployment of Database Systems [T-INFO-101317]****Responsible:** Prof. Dr.-Ing. Klemens Böhm**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-100780 - Deployment of Database Systems](#)  
[M-INFO-101208 - Innovative Concepts of Data and Information Management](#)  
[M-INFO-101256 - Theory and Practice of Data Warehousing and Mining](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each winter term	1

Events					
WS 19/20	2400020	<a href="#">Datenbankeinsatz</a>	3 SWS	Lecture (V)	Schäler
Exams					
WS 19/20	7500007	<a href="#">Deployment of Database Systems</a>		Prüfung (PR)	Böhm

T

**6.81 Course: Derivatives [T-WIWI-102643]**

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101482 - Finance 1](#)  
[M-WIWI-101483 - Finance 2](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2530550	<a href="#">Derivatives</a>	2 SWS	Lecture (V)	Uhrig-Homburg, Thimme
SS 2020	2530551	<a href="#">Übung zu Derivate</a>	1 SWS	Practice (Ü)	Uhrig-Homburg, Eska
Exams					
WS 19/20	7900051	<a href="#">Derivatives</a>		Prüfung (PR)	Uhrig-Homburg

**Competence Certificate**

The assessment takes place in the form of a written examination (75 minutes) according to §4(2), 1 SPO. The examination takes place during the semester break. 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 up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

**Prerequisites**

None

**Recommendation**

None

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

V

**Derivatives**2530550, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

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

**Weiterführende Literatur:**

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

## T

## 6.82 Course: Design Thinking [T-WIWI-102866]

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Events					
WS 19/20	2545008	<a href="#">Design Thinking (Track 1)</a>	2 SWS	Seminar (S)	Jochem, Terzidis, Lau
SS 2020	2545008	<a href="#">Design Thinking (Track 1)</a>	2 SWS	Seminar (S)	Terzidis, González
Exams					
WS 19/20	7900084	<a href="#">Design Thinking (Track 1)</a>		Prüfung (PR)	Terzidis
SS 2020	7900053	<a href="#">Design Thinking (Track 1)</a>		Prüfung (PR)	Terzidis

**Competence Certificate**

Alternative exam assessments (§4(2), 3 SPO).

**Prerequisites**

None

**Recommendation**

None

**Annotation**

The seminar content will be published on the website of the institute.

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

## V

**Design Thinking (Track 1)**

2545008, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)**

**Content**

Design Thinking is a user-centric innovation management method. The iterative process first analyzes the problem space and builds a sound understanding of the future users. Subsequently, ideas for the solution are generated, prototypes are created and tested by the user group. The result is a proven and validated product.

Learning goals:

During the seminar, the students learn basic procedures for achieving user-centric innovations. These are concrete methods that start with the potential user of certain products and services. The method is problem-oriented and emphasizes the specific customer situation. After attending the seminar, the students have a clear understanding of the need to explore end-user needs and are able to independently apply the methods of Design Thinking for developing market-driven innovations at a basic level.

Credentials:

Registration is via the Wiwi portal.

**ATTENTION:** Creditability in the seminar module: The seminar is NOT credited in the seminar module! Crediting is only possible in the EXPERT MODULE ENTREPRENEURSHIP.

T

**6.83 Course: Designing Interactive Systems [T-WIWI-110851]**

**Responsible:** Prof. Dr. Alexander Mädche  
Dr. Stefan Morana

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

**Part of:** [M-WIWI-104068 - Information Systems in Organizations](#)  
[M-WIWI-104080 - Designing Interactive Information Systems](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	1

Events					
SS 2020	2540558	<a href="#">Designing Interactive Systems</a>	3 SWS	Lecture (V)	Mädche, Gnewuch , Benke

**Competence Certificate**

Alternative exam assessment. The assessment consists of a one-hour exam and the implementation of a Capstone project. Details will be announced at the beginning of the course.

**Prerequisites**

None

**Annotation**

This course replaces T-WIWI-108461 "Interactive Information Systems" starting summer term 2020.

The course is held in english.

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

V

**Designing Interactive Systems**

2540558, SS 2020, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content****Description**

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 systems 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.

The aim of this course is to introduce advanced concepts and theories, interaction technologies as well as current practice of contemporary interactive systems.

The course is complemented with a design capstone project, where students in a team select and apply design methods & techniques in order to create an interactive prototype

**Learning objectives**

- Get an advanced understanding of conceptual foundations of interactive systems from a human and computer perspective
- explore the theoretical grounding of Interactive Systems leveraging theories from reference disciplines such as psychology
- know specific design principles for the design of advanced interactive systems
- get hands-on experience in conceptualizing and designing advanced Interactive Systems to solve a real-world challenge from an industry partner by applying the lecture contents.

**Prerequisites**

No specific prerequisites are required for the lecture

**Literature**

Die Vorlesung basiert zu einem großen Teil auf

• Benyon, D. (2014). Designing interactive systems: A comprehensive guide to HCI, UX and interaction design (3. ed.). Harlow: Pearson.

Weiterführende Literatur wird in der Vorlesung bereitgestellt.

T

**6.84 Course: Developing Business Models for the Semantic Web [T-WIWI-102851]**

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Irregular	1

**Competence Certificate**

Alternative exam assessments.

**Prerequisites**

None

**Recommendation**

As a recommendation to attending the seminar, basic knowledge about semantic technologies and concepts should be available. This may be acquired by attending one of the following lectures – Wissensmanagement, Semantic Web Technologies 1, Semantic Web Technologies 2 or by studying related literature. Furthermore the topic entrepreneurship should be of interest.



T

**6.85 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	Recurrence	Version
Written examination	6	Each summer term	1

Events					
SS 2020	24007	<a href="#">Digital Circuits Design</a>	3 SWS	Lecture (V)	Hanebeck
Exams					
WS 19/20	7500254	<a href="#">Digital Circuits Design</a>		Prüfung (PR)	Henkel, Karl, Tahoori

T

**6.86 Course: Digital Health [T-WIWI-109246]**

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-104403 - Critical Digital Infrastructures](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each winter term	3

Events					
WS 19/20	2511402	<a href="#">Digital Health</a>	2 SWS	Lecture (V)	Sunyaev, Thiebes
Exams					
WS 19/20	7900068	<a href="#">Digital Health</a>		Prüfung (PR)	Sunyaev

**Competence Certificate**

Alternative exam assessment (written elaboration, presentation, peer review, oral participation) according to §4(2),3 of the examination regulation. Details of the grading will be announced at the beginning of the course.

**Prerequisites**

None.

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

V

**Digital Health**

2511402, WS 19/20, 2 SWS, Language: German/English, [Open in study portal](#)

Lecture (V)

### Content

The course Digital Health offers students a possibility to gain insight into current developments in the digitalization of the health care system. Students will first be introduced to the basics and challenges of the digitalization of the health care system. After the introduction lecture, the course aims to give insights into current topics in the field of digital health and offers students an opportunity to prepare a scientific paper in a group of up to three students.

There will be a short introduction lecture on all topics with regard to the written assignments. It is possible for students to write their paper in one of the following topics. Furthermore, groups of students have the possibility to propose their own topics.

- **Artificial Intelligence**
- **Blockchain**
- **Cloud Computing**
- **Gamification**
- **Genomics**
- **Information Privacy**

In addition to introduction lectures on the topics, an online course is offered to introduce students to scientific writing. This includes learning how to quote, how a scientific paper is structured and in which form the results of one's research are presented. Since we offer topics that also correspond to the research interests of our research associates, there may also be the opportunity to investigate these topics more deeply in a master thesis. Students can give their preferences for the topics offered and are afterwards assigned to groups of up to three students based on their preferences.

### Learning objectives:

Students are familiar with the current developments and challenges of digitization in the health care sector, can independently develop corresponding solutions, and discuss their developed solutions in groups.

### Workload:

4,5 ECTS = approx. 135 hours.

### Comments:

The number of participants is limited. Please register via the WiWi portal: <https://portal.wiwi.kit.edu/ys/3107>

Please keep the following dates available if you are planning to attend the course:

- **Introduction:** 3 dates you have to attend
  - **10.2019, 15.45 to 17.15:** Foundations of Digital Health. (Geb. 05.20, R1C-03)
  - **10.2019, 15.45 to 17.15:** Cloud Computing, Genomics, Information Privacy (Geb. 05.20, R1C-03)
  - **11.2019, 15.45 to 17.15:** Blockchain, Artificial Intelligence, Gamification (Geb. 05.20, R1C-03)
- **Intermediate presentation** to be attended: 04.12.2019, 10:00 to 16:00 (Building 05.20, R1A-11). Exact times will be announced soon.
- **Final presentation to be attended:** 02.2020 and 27.02.2020, 09:00 to 19:00 (Building 05.20, R1C-03). Exact times will be announced soon.
- **Submission of the written assignment:** Estimated on 12.02.2019. Final date will be announced in the event.

Further information on the procedure will be announced in the first lecture. Depending on the number of participants, each session may have a shorter duration.

The meetings will take place at the Institute AIFB, KIT-Campus Süd, Kollegiengebäude am Kronenplatz (building 05.20), Kaiserstr. 89.

The number of participants is limited to 30 students. The registration period is from **31.08.2019 to 17.10.2019**. The places are expected to be allocated on **18.10.2019** and must be accepted by the students by **22.10.2019**. If the allocation is not accepted, the free places will be offered to the students in the waiting list.

If you have any questions regarding this registration, please contact [scott.thiebes@kit.edu](mailto:scott.thiebes@kit.edu) or [manuel.schmidt-kraepelin@kit.edu](mailto:manuel.schmidt-kraepelin@kit.edu).

T

**6.87 Course: Digital Marketing and Sales in B2B [T-WIWI-106981]**

**Responsible:** Anja Konhäuser  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-105312 - Marketing and Sales Management](#)

Type	Credits	Recurrence	Version
Examination of another type	1,5	Each winter term	1

Events					
WS 19/20	2572176	<a href="#">Digital Marketing and Sales in B2B</a>	1 SWS	Others (sonst.)	Konhäuser
Exams					
WS 19/20	7900169	<a href="#">Digital Marketing and Sales in B2B</a>		Prüfung (PR)	Klarmann

**Competence Certificate**

Alternative exam assessment according to § 4 paragraph 2 Nr. 3 of the examination regulation. (team presentation of a case study with subsequent discussion totalling 30 minutes).

**Prerequisites**

None.

**Annotation**

Participation requires an application. The application period starts at the beginning of the semester. More information can be obtained on the website of the research group Marketing and Sales ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)).

Access to this course is restricted. Typically all students will be granted the attendance of one course with 1.5 ECTS. Nevertheless attendance can not be guaranteed.

For further information please contact Marketing and Sales Research Group ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)).

Please note that only one of the 1.5-ECTS courses can be attended in this module.

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

V

**Digital Marketing and Sales in B2B**

2572176, WS 19/20, 1 SWS, Language: English, [Open in study portal](#)

Others (sonst.)

**Content**

## Learning Sessions:

The class gives insights into digital marketing strategies as well as the effects and potential of different channels (e.g., SEO, SEA, Social Media). After an overview of possible activities and leverages in the digital marketing field, including their advantages and limits, the focus will turn to the B2B markets. There are certain requirements in digital strategy specific to the B2B market, particularly in relation to the value chain, sales management and customer support. Therefore, certain digital channels are more relevant for B2B marketing than for B2C marketing.

Once the digital marketing and tactics for the B2B markets are defined, further insights will be given regarding core elements of a digital strategy: device relevance (mobile, tablet), usability concepts, website appearance, app decision, market research and content management. A major advantage of digital marketing is the possibility of being able to track many aspects of user reactions and user behaviour. Therefore, an overview of key performance indicators (KPIs) will be discussed and relationships between these KPIs will be explained. To measure the effectiveness of digital activities, a digital report should be set up and connected to the performance numbers of the company (e.g. product sales) – within the course the setup of the KPI dashboard and combination of digital and non-digital measures will be shown to calculate the Return on Investment (RoI).

## Presentation Sessions:

After the learning sessions, the students will form groups and work on digital strategies within a case study format. The presentation of the digital strategy will be in front of the class whereas the presentation will take 20 minutes followed by 10 minutes questions and answers.

- Understand digital marketing and sales approaches for the B2B sector
- Recognise important elements and understand how-to-setup of digital strategies
- Become familiar with the effectiveness and usage of different digital marketing channels
- Understand the effect of digital sales on sales management, customer support and value chain
- Be able to measure and interpret digital KPIs
- Calculate the Return on Investment (RoI) for digital marketing by combining online data with company performance data

time of presentness = 15 hrs.

private study = 30 hrs.

**Literature**

-

## T

## 6.88 Course: Digital Services: Business Models and Transformation [T-WIWI-110280]

**Responsible:** Prof. Dr. Gerhard Satzger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101448 - Service Management](#)  
[M-WIWI-102754 - Service Economics and Management](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2595484	<a href="#">Digital Services: Business Models and Transformation</a>	2 SWS	Lecture (V)	Satzger, Schüritz
WS 19/20	2595485		1 SWS	Practice (Ü)	Enders, Schüritz
Exams					
WS 19/20	7900302	<a href="#">Digital Services: Business Models and Transformation</a>		Prüfung (PR)	Satzger

**Competence Certificate**

The assessment of this course is a written examination (60 min.) (following §4(2), 1 SPOs) and by submitting written papers as part of the exercise.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

former name until winter semester 2019/2020: "Business and IT Service Management" (T-WIWI-102881)

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

## V

**Digital Services: Business Models and Transformation**

2595484, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

While the digitalization creates new opportunities for organizations, it also comes with its challenges: formerly proven business models become obsolete and need to be refined, internal processes cannot keep up with the requirements of the market and need to reassessed in any way.

The shift towards a service-based economy enables and requires companies to leverage advances in information technology to create added value for their customers. In particular, the emergence of big data and analytics enables better decision-making. The lecture teaches approaches that enable organizations to adapt their business models to new market requirements and showcases how to plan and execute a successful transformation to the desired organizational setup.

The lecture links academic content with practical examples and excises. Students are asked to actively engage in the discussion and contribute their knowledge. Invited guest speakers from industry and case studies emphasize the practical character of this lecture.

**Literature**

Böhmman, T./ Leimeister, J.M./ Möslin, K. (2014), Service Systems Engineering, Business & Information Systems Engineering, Vol. 6, No.2, 73-79

Cardoso et al. (Hrsg.) (2015), Fundamentals on Service Systems

Hartmann/ Zaki/ Feldmann/ Neely (2016), Capturing value from big data - a taxonomy of data-driven business models used by start-up firms, IJPOR, 36 (10), 1382-1406.

Schüritz R./Seebacher S./Satzger G./Schwartz L. (2017), Datatization as the Next Frontier of Servitization; in Proceedings of International Conference on Information Systems 2017

Vargo S. / Lusch R. (2017) Service-dominant logic 2025, in: IJRM 34, 46-67

Weill, P.; Woerner, S.L. (2018): "What's your Digital Business Model? – Six Questions to Help you Build the Next-Generation Enterprise". Boston, Massachusetts: Harvard Business Review Press.

Wirtz, B.(2019): "Digital Business Models – Concepts, Models, and the Alphabet Case Study". Springer.

T

**6.89 Course: Digital Signatures [T-INFO-101280]**

**Responsible:** Prof. Dr. Dennis Hofheinz  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101198 - Advanced Topics in Cryptography](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each winter term	1

Exams				
WS 19/20	7500094	<a href="#">Digital signatures</a>	Prüfung (PR)	Geiselman, Müller-Quade, Hofheinz



T

**6.90 Course: Digital Transformation and Business Models [T-WIWI-108875]**

**Responsible:** Dr. Daniel Jeffrey Koch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101507 - Innovation Management](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each summer term	1

Events					
SS 2020	2545103	<a href="#">Digital Transformation and Business Models</a>	2 SWS	Seminar (S)	Koch
Exams					
SS 2020	7900284	<a href="#">Digital Transformation and Business Models</a>	Prüfung (PR)	Weissenberger-Eibl	

**Competence Certificate**

Non exam assessment (following §4(2) 3 of the examination regulation). The final grade is composed 75% of the grade of the written paper and 25% of the presentation.

**Prerequisites**

None

**Recommendation**

Prior attendance of the course Innovation Management is recommended.

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

V

**Digital Transformation and Business Models**

2545103, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)****Content**

The seminar "Digital Transformation and Business Models" aims at the development of thematic aspects of digital transformation with simultaneous application of different business model methodologies. Established companies face the challenge of digital transformation. The digital transformation is particularly relevant for the business models of industrial enterprises. As part of innovation management, the examination of business model changes against the background of digital transformation is one of the main challenges facing the German economy. At the beginning, seminar topics will be assigned. These will be presented and discussed at the end of the seminar. In the first seminar date impulses to business model methodologies and the digital transformation take place, which are to be discussed then, in order to provide an understanding for the topic complex and to ensure the purposeful development of the seminar topics.

**6.91 Course: Digital Transformation of Organizations [T-WIWI-106201]**

**Responsible:** Prof. Dr. Alexander Mädche  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101410 - Business & Service Engineering](#)  
[M-WIWI-101448 - Service Management](#)  
[M-WIWI-102754 - Service Economics and Management](#)  
[M-WIWI-102808 - Digital Service Systems in Industry](#)  
[M-WIWI-104068 - Information Systems in Organizations](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	2

Events					
SS 2020	2540556	<a href="#">Digital Transformation of Organizations</a>	3 SWS	Lecture (V)	Mädche
Exams					
WS 19/20	7900230	<a href="#">Digital Transformation of Organizations</a>		Prüfung (PR)	Mädche

**Competence Certificate**

The lecture will be offered for the last time in summer semester 2020. The last possibility for examination is in winter semester 2020/21 (only for repeaters).

The assessment consists of a written exam of 1 hour length and by submitting written papers as part of the exercise. Details will be announced at the beginning of the course.

**Prerequisites**

None

**Annotation**

The course will be held in English.

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

**Digital Transformation of Organizations**

2540556, SS 2020, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

siehe englischsprachige Literaturliste

T

**6.92 Course: Discrete-Event Simulation in Production and Logistics [T-WIWI-102718]**

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-102805 - Service Operations](#)  
[M-WIWI-102832 - Operations Research in Supply Chain Management](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2550488	<a href="#">Ereignisdiskrete Simulation in Produktion und Logistik</a>	3 SWS	Lecture (V)	Spieckermann

**Competence Certificate**

The assessment consists of a written paper and an oral exam of about 30-40 min (alternative exam assessment).

**Prerequisites**

None

**Recommendation**

Basic knowledge as conveyed in the module "Introduction to Operations Research" is assumed.

**Annotation**

Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.

The course is planned to be held 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

**Ereignisdiskrete Simulation in Produktion und Logistik**

2550488, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

Simulation of production and logistics systems is an interdisciplinary subject connecting expert knowledge from production management and operations research with mathematics/statistics as well as computer science and software engineering. With completion of this course, students know statistical foundations of discrete simulation, are able to classify and apply related software applications, and know the relation between simulation and optimization as well as a number of application examples. Furthermore, students are enabled to structure simulation studies and are aware of specific project scheduling issues.

**Literature**

- Banks J., Carson II J. S., Nelson B. L., Nicol D. M. (2010) Discrete-event system simulation, 5.Aufl., Pearson, Upper Saddle River.
- Eley, M. (2012): Simulation in der Logistik - Einführung in die Erstellung ereignisdiskreter Modelle unter Verwendung des Werkzeuges "Plant Simulation", Springer, Berlin und Heidelberg
- Kosturiak, J. und M. Gregor (1995): Simulation von Produktionssystemen. Springer, Wien und New York.
- Law, A. M. (2015): Simulation Modeling and Analysis. 5th Edition, McGraw-Hill, New York usw.
- Liebl, F. (1995): Simulation. 2. Auflage, Oldenbourg, München.
- Noche, B. und S. Wenzel (1991): Marktspiegel Simulationstechnik. In: Produktion und Logistik. TÜV Rheinland, Köln.
- Pidd, M. (2004): Computer Simulation in Management Science. 5th Edition, Wiley, Chichester.
- Robinson S (2004) Simulation: the practice of model development and use. John Wiley & Sons, Chichester
- VDI (2014): Simulation von Logistik-, Materialfluß- und Produktionssystemen. VDI Richtlinie 3633, Blatt 1, VDI-Verlag, Düsseldorf.

T

## 6.93 Course: Distributed Computing [T-INFO-101298]

**Responsible:** Prof. Dr. Achim Streit  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101210 - Dynamic IT-Infrastructures](#)

Type	Credits	Recurrence	Version
Written examination	4	Each winter term	2

Events					
WS 19/20	2400050	<a href="#">Distributed Computing</a>	2 SWS	Lecture (V)	Streit, Krauß, Kühn
Exams					
WS 19/20	7500172	<a href="#">Distributed Computing</a>		Prüfung (PR)	Streit

T

## 6.94 Course: Dynamic Macroeconomics [T-WIWI-109194]

**Responsible:** Prof. Dr. Johannes Brumm  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101478 - Innovation and Growth](#)  
[M-WIWI-101496 - Growth and Agglomeration](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2560402	<a href="#">Dynamic Macroeconomics</a>	2 SWS	Lecture (V)	Scheffel
WS 19/20	2560403	<a href="#">Übung zu Dynamic Macroeconomics</a>	1 SWS	Practice (Ü)	Krause
Exams					
WS 19/20	7900261	<a href="#">Dynamic Macroeconomics</a>		Prüfung (PR)	Scheffel

**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

**Dynamic Macroeconomics**

2560402, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

Literatur und Skripte werden in der Veranstaltung angegeben.

T

## 6.95 Course: Efficient Energy Systems and Electric Mobility [T-WIWI-102793]

**Responsible:** PD Dr. Patrick Jochem  
Prof. Dr. Russell McKenna

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

**Part of:** [M-WIWI-101452 - Energy Economics and Technology](#)

Type	Credits	Recurrence	Version
Written examination	3,5	Each summer term	1

Events					
SS 2020	2581006	<a href="#">Efficient Energy Systems and Electric Mobility</a>	2 SWS	Lecture (V)	Jochem, Fichtner
Exams					
WS 19/20	7981006	<a href="#">Efficient Energy Systems and Electric Mobility</a>		Prüfung (PR)	Fichtner

### Competence Certificate

See German version.

### Prerequisites

None

### Recommendation

None

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

V

### Efficient Energy Systems and Electric Mobility

2581006, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Content

This lecture series combines two of the most central topics in the field of energy economics at present, namely energy efficiency and electric mobility. The objective of the lecture is to provide an introduction and overview to these two subject areas, including theoretical as well as practical aspects, such as the technologies, political framework conditions and broader implications of these for national and international energy systems.

- Understand the concept of energy efficiency as applied to specific systems
- Obtain an overview of the current trends in energy efficiency
- Be able to determine and evaluate alternative methods of energy efficiency improvement
- Overview of technical and economical stylized facts on electric mobility
- Judging economical, ecological and social impacts through electric mobility

### Literature

Wird in der Vorlesung bekanntgegeben.

## T

## 6.96 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-101446 - Market Engineering](#)  
[M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2540454	<a href="#">eFinance: Information Systems for Securities Trading</a>	2 SWS	Lecture (V)	Weinhardt, Notheisen
WS 19/20	2540455	<a href="#">Übungen zu eFinance: Wirtschaftsinformatik für den Wertpapierhandel</a>	1 SWS	Practice (Ü)	Jaquart, Soufi
Exams					
WS 19/20	7900182	<a href="#">eFinance: Information Engineering and Management for Securities Trading</a>		Prüfung (PR)	Weinhardt
WS 19/20	7900309	<a href="#">eFinance: Information Systems for Securities Trading</a>		Prüfung (PR)	Weinhardt

**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

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

## V

**eFinance: Information Systems for Securities Trading**

2540454, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

- Picot, Arnold, Christine Bortenlänger, Heiner Röhl (1996): "Börsen im Wandel". Knapp, Frankfurt
- Harris, Larry (2003): "Trading and Exchanges - Market Microstructure for Practitioners". Oxford University Press, New York

**Weiterführende Literatur:**

- Gomber, Peter (2000): "Elektronische Handelssysteme - Innovative Konzepte und Technologien". Physika Verlag, Heidelberg
- Schwartz, Robert A., Reto Francioni (2004): "Equity Markets in Action - The Fundamentals of Liquidity, Market Structure and Trading". Wiley, Hoboken, NJ

T

**6.97 Course: Emerging Trends in Digital Health [T-WIWI-110144]**

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-104403 - Critical Digital Infrastructures](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	2

Events					
SS 2020	2513404	<a href="#">Emerging Trends in Digital Health (Bachelor)</a>	2 SWS	Seminar (S)	Lins, Sunyaev, Thiebes
SS 2020	2513405	<a href="#">Emerging Trends in Digital Health (Master)</a>	2 SWS	Seminar (S)	Lins, Sunyaev, Thiebes
Exams					
SS 2020	7900146	<a href="#">Emerging Trends in Digital Health (Master)</a>		Prüfung (PR)	Sunyaev

**Competence Certificate**

The alternative exam assessment consists of a final thesis.

**Prerequisites**

None.

**Annotation**

The course is usually held as a block course.



T

## 6.98 Course: Emerging Trends in Internet Technologies [T-WIWI-110143]

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-104403 - Critical Digital Infrastructures](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	2

Events					
SS 2020	2513402	<a href="#">Emerging Trends in Internet Technologies (Bachelor)</a>	2 SWS	Seminar (S)	Lins, Sunyaev, Thiebes
SS 2020	2513403	<a href="#">Emerging Trends in Internet Technologies (Master)</a>	2 SWS	Seminar (S)	Lins, Sunyaev, Thiebes
Exams					
SS 2020	7900128	<a href="#">Emerging Trends in Internet Technologies (Master)</a>		Prüfung (PR)	Sunyaev

### Competence Certificate

The alternative exam assessment consists of a final thesis.

### Prerequisites

None.

### Annotation

The course is usually held as a block course.

T

**6.99 Course: Emissions into the Environment [T-WIWI-102634]**

**Responsible:** Ute Karl  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101412 - Industrial Production III](#)  
[M-WIWI-101471 - Industrial Production II](#)

Type	Credits	Recurrence	Version
Written examination	3,5	Each winter term	1

Events					
WS 19/20	2581962	<a href="#">Emissions into the Environment</a>	2 SWS	Lecture (V)	Karl
Exams					
WS 19/20	7981962	<a href="#">Emissions into the Environment</a>		Prüfung (PR)	Schultmann

**Competence Certificate**

The assessment consists of an oral (30 minutes) or a written (60 minutes) exam (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Recommendation**

None

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

V

**Emissions into the Environment**

2581962, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

Emission sources/emission monitoring/emission reduction: The lecture gives an overview of relevant emissions of air pollutants and greenhouse gases, emission monitoring and pollutant abatement options together with relevant legal regulations at national and international level. In addition, the fundamentals of circular economy, waste management and recycling are explained.

Structure:

Air pollution control

- Introduction, terms and definitions
- Sources of air pollutants
- Legal framework of air quality control
- Technical measures to reduce air pollutant emissions

Circular economy, recycling and waste management

- Waste collection and logistics
- Dual systems for packaging waste
- Recycling
- Thermal and biological waste treatment
- Final waste disposal

**Literature**

Wird in der Veranstaltung bekannt gegeben.

T

**6.100 Course: Employment Law I [T-INFO-101329]**

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101216 - Private Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
WS 19/20	24167	<a href="#">Employment Law I</a>	2 SWS	Lecture (V)	Hoff
Exams					
WS 19/20	7500040	<a href="#">Employment Law I</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500097	<a href="#">Employment Law I</a>		Prüfung (PR)	Dreier, Matz

T

**6.101 Course: Employment Law II [T-INFO-101330]**

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101216 - Private Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
SS 2020	24668	<a href="#">Employment Law II</a>	2 SWS	Lecture (V)	Hoff
Exams					
WS 19/20	7500058	<a href="#">Employment Law II</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500098	<a href="#">Employment Law II</a>		Prüfung (PR)	Dreier, Matz

T

**6.102 Course: Energy and Environment [T-WIWI-102650]**

**Responsible:** Ute Karl  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101452 - Energy Economics and Technology](#)  
[M-WIWI-101468 - Environmental Economics](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2581003	<a href="#">Energy and Environment</a>	2 SWS	Lecture (V)	Karl
SS 2020	2581004	<a href="#">Übungen zu Energie und Umwelt</a>	1 SWS	Practice (Ü)	Keles, Weinand
Exams					
WS 19/20	7981003	<a href="#">Energy and Environment</a>		Prüfung (PR)	Fichtner

**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

**Energy and Environment**

2581003, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The lecture focuses on the environmental impacts arising from fossil fuels use and on the methods for the evaluation of such impacts. The first part of the lecture describes the environmental impacts of air pollutants and greenhouse gases as well as technical measures for emission control. The second part covers methods of impact assessment and their use in environmental communication as well as methods for the scientific support of emission control strategies.

The topics include:

- Fundamentals of energy conversion
- Formation of air pollutants during combustion
- Technical measures to control emissions from fossil-fuel combustion processes
- External effects of energy supply (life cycle analyses of selected energy systems)
- Environmental communication on energy services (e.g. electricity labelling, carbon footprint)
- Integrated Assessment Modelling to support the European Clean Air Strategy
- Cost-effectiveness analyses and cost-benefit analyses for emission control strategies
- Monetary valuation of external effects (external costs)

**Literature**

Die Literaturhinweise sind in den Vorlesungsunterlagen enthalten (vgl. ILIAS)

T

## 6.103 Course: Energy Market Engineering [T-WIWI-107501]

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101446 - Market Engineering](#)  
[M-WIWI-101451 - Energy Economics and Energy Markets](#)  
[M-WIWI-103720 - eEnergy: Markets, Services and Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2540464	<a href="#">Energy Market Engineering</a>	2 SWS	Lecture (V)	Staudt, vom Scheidt
SS 2020	2540465	<a href="#">Übung zu Energy Market Engineering</a>	1 SWS	Practice (Ü)	Staudt, Richter
Exams					
WS 19/20	7901171	<a href="#">Energy Market Engineering (Nachklausur aus dem SS19)</a>		Prüfung (PR)	Weinhardt

**Competence Certificate**

The assessment consists of a written exam (60 min) (according to §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**

None

**Recommendation**

None

**Annotation**

Former course title until summer term 2017: T-WIWI-102794 "eEnergy: Markets, Services, Systems".

The lecture has also been added in the IIP Module *Basics of Liberalised Energy Markets*.

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

V

**Energy Market Engineering**

2540464, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

- Erdmann G, Zweifel P. *Energieökonomik, Theorie und Anwendungen*. Berlin Heidelberg: Springer; 2007.
- Grimm V, Ockenfels A, Zoettl G. Strommarktdesign: Zur Ausgestaltung der Auktionsregeln an der EEX\*. *Zeitschrift für Energiewirtschaft*. 2008:147-161.
- Stoff S. *Power System Economics: Designing Markets for Electricity*. IEEE; 2002.,
- Ströbele W, Pfaffenberger W, Heuterkes M. *Energiewirtschaft: Einführung in Theorie und Politik*. 2nd ed. München: Oldenbourg Verlag; 2010:349.

T

## 6.104 Course: Energy Networks and Regulation [T-WIWI-107503]

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101446 - Market Engineering](#)  
[M-WIWI-103720 - eEnergy: Markets, Services and Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2540494	<a href="#">Energy Networks and Regulation</a>	2 SWS	Lecture (V)	Rogat
WS 19/20	2540495	<a href="#">Übung zu Energy Networks and Regulation</a>	1 SWS	Practice (Ü)	Rogat
Exams					
WS 19/20	7900198	<a href="#">Energy Networks and Regulation</a>		Prüfung (PR)	Weinhardt
WS 19/20	7900236	<a href="#">Energy Networks and Regulation</a>		Prüfung (PR)	Weinhardt

### Competence Certificate

The assessment consists of a written exam according to Section 4 (2), 1 of the examination regulation. The exam is offered every semester. Re-examinations are offered on every ordinary examination date.

### Prerequisites

None

### Recommendation

None

### Annotation

Former course title until summer term 2017: T-WIWI-103131 "Regulatory Management and Grid Management - Economic Efficiency of Network Operation"

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

V

### Energy Networks and Regulation

2540494, WS 19/20, 2 SWS, [Open in study portal](#)

Lecture (V)

**Content****Learning Goals**

The student,

- understands the business model of a network operator and knows its central tasks in the energy supply system,
- has a holistic overview of the interrelationships in the network economy,
- understands the regulatory and business interactions,
- is in particular familiar with the current model of incentive regulation with its essential components and understands its implications for the decisions of a network operator
- is able to analyse and assess controversial issues from the perspective of different stakeholders.

**Content of teaching**

The lecture “Energy Networks and Regulation” provides insights into the regulatory framework of electricity and gas. It touches upon the way the grids are operated and how regulation affects almost all grid activities. The lecture also addresses approaches of grid companies to cope with regulation on a managerial level. We analyze how the system influences managerial decisions and strategies such as investment or maintenance. Furthermore, we discuss how the system affects the operator’s abilities to deal with the massive challenges lying ahead (“Energiewende”, redispatch, European grid integration, electric vehicles etc.). Finally, we look at current developments and major upcoming challenges, e.g., the smart meter rollout. Covered topics include:

- Grid operation as a heterogeneous landscape: big vs. small, urban vs. rural, TSO vs. DSO
- Objectives of regulation: Fair price calculation and high standard access conditions
- The functioning of incentive regulation
- First major amendment to the incentive regulation: its merits, its flaws
- The revenue cap and how it is adjusted according to certain exogenous factors
- Grid tariffs: How are they calculated, what is the underlying rationale, do we need a reform (and which)?
- Exogenous costs shifted (arbitrarily?) into the grid, e.g. feed-in tariffs for renewable energy or decentralized supply.

**Literature**

Averch, H.; Johnson, L.L (1962). Behavior of the firm under regulatory constraint, in: American Economic Review, 52 (5), S. 1052 – 1069.

Bundesnetzagentur (2006): Bericht der Bundesnetzagentur nach § 112a EnWG zur Einführung der Anreizregulierung nach § 21a EnWG, [http://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Energie/Unternehmen\\_Institutionen/Netzentgelte/Anreizregulierung/BerichtEinfuehrgAnreizregulierung.pdf?\\_\\_blob=publicationFile&v=3](http://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Energie/Unternehmen_Institutionen/Netzentgelte/Anreizregulierung/BerichtEinfuehrgAnreizregulierung.pdf?__blob=publicationFile&v=3).

Bundesnetzagentur (2015): Evaluierungsbericht nach § 33 Anreizregulierungsverordnung, [https://www.bmwi.de/Redaktion/DE/Downloads/A/anreizregulierungsverordnung-evaluierungsbericht.pdf?\\_\\_blob=publicationFile&v=1](https://www.bmwi.de/Redaktion/DE/Downloads/A/anreizregulierungsverordnung-evaluierungsbericht.pdf?__blob=publicationFile&v=1).

Filippini, M.; Wild, J.; Luchsinger, C. (2001): Regulierung der Verteilnetzpreise zu Beginn der Marktöffnung. Erfahrungen in Norwegen und Schweden, Bundesamt für Energie, Bern, [http://www.iaea.org/inis/collection/NCLCollectionStore/\\_Public/34/066/34066585.pdf](http://www.iaea.org/inis/collection/NCLCollectionStore/_Public/34/066/34066585.pdf).

Gómez, T. (2013): Monopoly Regulation, in: Pérez-Arriaga, I.J. (Hg.): Regulation of the Power Sector, S. 151 – 198, Springer-Verlag, London.

Gómez, T. (2013): Electricity Distribution, in: Pérez-Arriaga, I.J. (Hg.): Regulation of the Power Sector, S. 199 – 250, Springer-Verlag, London.

Pérez-Arriaga, I.J. (2013): Challenges in Power Sector Regulation, in: Pérez-Arriaga, I.J. (Hg.): Regulation of the Power Sector, S. 647 – 678, Springer-Verlag, London.

Rivier, M.; Pérez-Arriaga, I.J.; Olmos, L. (2013): Electricity Transmission, in: Pérez-Arriaga, I.J. (Hg.): Regulation of the Power Sector, S. 251 – 340, Springer-Verlag, London.



T

**6.105 Course: Energy Policy [T-WIWI-102607]**

**Responsible:** Prof. Dr. Martin Wietschel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101451 - Energy Economics and Energy Markets](#)

Type	Credits	Recurrence	Version
Written examination	3,5	Each summer term	3

Events					
SS 2020	2581959	<a href="#">Energy Policy</a>	2 SWS	Lecture (V)	Wietschel
Exams					
WS 19/20	7981959	<a href="#">Energy Policy</a>		Prüfung (PR)	Fichtner

**Competence Certificate**

The assessment consists of a written exam (60 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

**Energy Policy**

2581959, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)****Content**

The availability of cheap, environmentally friendly and secure energy is crucial for human welfare. However, the increasing scarcity of resources and increasing environmental pressures, with a particular focus on climate change, threaten human welfare through economic action. Energy contributes significantly to environmental pollution. The energy industry is characterised by high regulation and a significant influence of political decisions.

At the beginning of the lecture different perspectives on energy policy will be presented and the analysis of political decision-making processes will be discussed. Then the current energy policy challenges in the area of environmental pollution, regulation and the role of energy for households and industry will be discussed. Then the actors of energy policy and energy responsibilities in Europe will be discussed. The economic approaches from traditional environmental economics and sustainability as a new policy approach will then be discussed. Finally, energy policy instruments such as the promotion of renewable energies or energy efficiency are discussed in detail and how they can be evaluated.

The lecture emphasizes the relationship between theory and practice and presents some case studies.

**Literature**

Wird in der Vorlesung bekannt gegeben.

T

**6.106 Course: Energy Systems Analysis [T-WIWI-102830]**

**Responsible:** Dr. Armin Ardone  
Prof. Dr. Wolf Fichtner

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

**Part of:** [M-WIWI-101452 - Energy Economics and Technology](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2581002	<a href="#">Energy Systems Analysis</a>	2 SWS	Lecture (V)	Ardone, Keles, Dengiz, Yilmaz
Exams					
WS 19/20	7981002	<a href="#">Energy Systems Analysis</a>		Prüfung (PR)	Fichtner

**Competence Certificate**

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

**Prerequisites**

None

**Recommendation**

None

**Annotation**

Since 2011 the lecture is offered in winter term. Exams can still be taken in summer term.

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

V

**Energy Systems Analysis**

2581002, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

1. Overview and classification of energy systems modelling approaches
2. Usage of scenario techniques for energy systems analysis
3. Unit commitment of power plants
4. Interdependencies in energy economics
5. Scenario-based decision making in the energy sector
6. Visualisation and GIS techniques for decision support in the energy sector

Learning goals:

The student

- has the ability to understand and critically reflect the methods of energy system analysis, the possibilities of its application in the energy industry and the limits and weaknesses of this approach
- can use select methods of the energy system analysis by her-/himself

**Literature**

**Weiterführende Literatur:**

- Möst, D. und Fichtner, W.: **Einführung zur Energiesystemanalyse**, in: Möst, D., Fichtner, W. und Grunwald, A. (Hrsg.): Energiesystemanalyse, Universitätsverlag Karlsruhe, 2009
- Möst, D.; Fichtner, W.; Grunwald, A. (Hrsg.): **Energiesystemanalyse** - Tagungsband des Workshops "Energiesystemanalyse" vom 27. November 2008 am KIT Zentrum Energie, Karlsruhe, Universitätsverlag Karlsruhe, 2009 [PDF: <http://digbib.ubka.uni-karlsruhe.de/volltexte/documents/928852>]

T

**6.107 Course: Energy Trade and Risk Management [T-WIWI-102691]**

**Responsible:** Dr. Clemens Cremer  
Dr. Dogan Keles

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

**Part of:** [M-WIWI-101451 - Energy Economics and Energy Markets](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	2

Events					
SS 2020	2581020	<a href="#">Energy Trade and Risk Management</a>	2 SWS	Lecture (V)	Keles
Exams					
WS 19/20	7981020	<a href="#">Energy Trade and Risk Management</a>		Prüfung (PR)	Fichtner

**Competence Certificate**

The assessment consists of a written exam (60 minutes).

**Prerequisites**

None

**Recommendation**

None

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

V

**Energy Trade and Risk Management**

2581020, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

1. Introduction to Markets, Mechanisms and Interaction
2. Electricity Trading (platforms, products, mechanisms)
3. Balancing Energy Markets and Congestion Management
4. Coal Markets (reserves, supply, demand, and transport)
5. Investments and Capacity Markets
6. Oil and Gas Markets (supply, demand, trade, and players)
7. Trading Game
8. Risk Management in Energy Trading

**Literature****Weiterführende Literatur:**

Burger, M., Graeber, B., Schindlmayr, G. (2007): *Managing energy risk: An integrated view on power and other energy markets*, Wiley&Sons, Chichester, England

EEX (2010): *Einführung in den Börsenhandel an der EEX auf Xetra und Eurex*, [www.eex.de](http://www.eex.de)

Erdmann, G., Zweifel, P. (2008), *Energieökonomik, Theorie und Anwendungen*, Springer, ISBN: 978-3-540-71698-3

Hull, J.C. (2006): *Options, Futures and other Derivatives*, 6. Edition, Pearson Prentice Hall, New Jersey, USA

Borchert, J., Schlemm, R., Korth, S. (2006): *Stromhandel: Institutionen, Marktmodelle, Pricing und Risikomanagement (Gebundene Ausgabe)*, Schäffer-Poeschel Verlag

[www.riskglossary.com](http://www.riskglossary.com)

T

**6.108 Course: Engineering FinTech Solutions [T-WIWI-106193]**

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103247 - Intelligent Risk and Investment Advisory](#)  
[M-WIWI-105036 - FinTech Innovations](#)

Type	Credits	Recurrence	Version
Examination of another type	9	Each term	4

Events					
WS 19/20	2500020	<a href="#">Engineering FinTech Solutions</a>	6 SWS	Practical course (P)	Ulrich
SS 2020	2530357	<a href="#">Engineering FinTech Solutions</a>	6 SWS	Practical course (P)	Ulrich
Exams					
SS 2020	7900287	<a href="#">Engineering FinTech Solutions</a>		Prüfung (PR)	Ulrich

**Competence Certificate**

The assessment is carried out in form of a written thesis based on the course "Engineering FinTech Solutions".

**Prerequisites**

In order to take the course "Engineering FinTech Solutions", students must have completed the module "Data Science for Finance".

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

V

**Engineering FinTech Solutions**

2500020, WS 19/20, 6 SWS, Language: English, [Open in study portal](#)

**Practical course (P)****Content**

The assessment is carried out in form of a written thesis based on the course "Engineering FinTech Solutions".

This project invites students to either pursue their own FinTech innovation project or to contribute to the Chair's ongoing innovation projects.

The course is targeted to students with strong knowledge in the field of computational risk and asset management and strong programming skills. It offers students the opportunity to develop an algorithmic solution and hence ample their programming experience and their understanding of financial economics or asset and risk management.

In order to take the course "Engineering FinTech Solutions", students must have completed the module "Data Science for Finance" with a grade of 1.3 or better.

The total workload for this course is approximately 270 hours. This consists of regular meetings with members of the research group and time for independent work on the software project.

Students will learn to connect innovative financial research with modern information technology to build a prototype that solves some daunting tasks for professional end-users in the field of modern asset and risk management.

V

**Engineering FinTech Solutions**

2530357, SS 2020, 6 SWS, Language: English, [Open in study portal](#)

**Practical course (P)**

**Content**

The assessment is carried out in form of a written thesis based on the course "Engineering FinTech Solutions".

This project invites students to either pursue their own FinTech innovation project or to contribute to the Chair's ongoing innovation projects.

The course is targeted to students with strong knowledge in the field of computational risk and asset management and strong programming skills. It offers students the opportunity to develop an algorithmic solution and hence ample their programming experience and their understanding of financial economics or asset and risk management.

In order to take the course "Engineering FinTech Solutions", students must have completed the module "Data Science for Finance" with a grade of 1.3 or better.

The total workload for this course is approximately 270 hours. This consists of regular meetings with members of the research group and time for independent work on the software project.

Students will learn to connect innovative financial research with modern information technology to build a prototype that solves some daunting tasks for professional end-users in the field of modern asset and risk management.

**Literature**

Literatur wird in der ersten Vorlesung bekannt gegeben.

T

**6.109 Course: Engineering Interactive Systems [T-WIWI-110877]**

**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-102806 - Service Innovation, Design & Engineering](#)  
[M-WIWI-104080 - Designing Interactive Information Systems](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each winter term	1

Events					
WS 19/20	2540420	<a href="#">Digital Service Design</a>	3 SWS	Lecture (V)	Mädche

**Competence Certificate**

Alternative exam assessment. The assessment consists of a one-hour exam and the implementation of a Capstone project. Details will be announced at the beginning of the course.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

The course is held in English.

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

V

**Digital Service Design**

2540420, WS 19/20, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

Siehe Englische Literatur

T

## 6.110 Course: Entrepreneurial Leadership & Innovation Management [T-WIWI-102833]

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Irregular	3

### Competence Certificate

Please note: The seminar cannot be offered in the winter semester 2019/2020 due to organizational reasons. Alternative exam assessment.

### Prerequisites

None

### Recommendation

None

T

**6.111 Course: Entrepreneurship [T-WIWI-102864]**

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
SS 2020	2545001	<a href="#">Entrepreneurship</a>	2 SWS	Lecture (V)	Terzidis
Exams					
WS 19/20	7900045	<a href="#">Entrepreneurship</a>		Prüfung (PR)	Terzidis
WS 19/20	7900229	<a href="#">Entrepreneurship</a>		Prüfung (PR)	Terzidis

**Competence Certificate**

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

**Prerequisites**

None

**Recommendation**

None

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

V

**Entrepreneurship**

2545001, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

Füglistaller, Urs, Müller, Christoph und Volery, Thierry (2008): Entrepreneurship

Ries, Eric (2011): The Lean Startup

Osterwalder, Alexander (2010): Business Model Generation



T

**6.112 Course: Entrepreneurship Research [T-WIWI-102894]**

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each summer term	1

Events					
SS 2020	2545002	<a href="#">Entrepreneurship Research</a>	2 SWS	Seminar (S)	Terzidis, Henn
Exams					
SS 2020	7900052	<a href="#">Entrepreneurship Research</a>		Prüfung (PR)	Terzidis

**Competence Certificate**

The performance review is done via a so called other methods of performance review (term paper) (alternative exam assessment). The final grade is a result from both, the grade of the term paper and its presentation, as well as active participation during the seminar.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

The topics will be prepared in groups. The presentation of the results is done during a a block period seminar at the end of the semester. Students have to be present all day long during the seminar.

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

V

**Entrepreneurship Research**2545002, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Literature**

Wird im Seminar bekannt gegeben.

T

**6.113 Course: Environmental and Resource Policy [T-WIWI-102616]**

**Responsible:** Rainer Walz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101468 - Environmental Economics](#)

Type	Credits	Recurrence	Version
Written examination	4	Each summer term	1

Events					
SS 2020	2560548	<a href="#">Environmental and Ressource Policy</a>	2 SWS	Lecture / Practice (VÜ)	Walz
Exams					
WS 19/20	7900294	<a href="#">Environmental and Resource Policy</a>		Prüfung (PR)	Walz

**Competence Certificate**

See German version

**Recommendation**

It is recommended to already have knowledge in the area of industrial organization and economic policy. This knowledge may be acquired in the courses *Introduction to Industrial Organization* [2520371] and *Economic Policy* [2560280].

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

V

**Environmental and Ressource Policy**2560548, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

**Literature****Weiterführende Literatur:**

Michaelis, P.: *Ökonomische Instrumente in der Umweltpolitik. Eine anwendungsorientierte Einführung*, Heidelberg  
 OECD: *Environmental Performance Review Germany*, Paris

T

**6.114 Course: Environmental Economics and Sustainability [T-WIWI-102615]**

**Responsible:** Prof. Dr. Rainer Walz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101468 - Environmental Economics](#)

Type	Credits	Recurrence	Version
Written examination	5	Each winter term	1

Events					
WS 19/20	2521547	<a href="#">Umweltökonomik und Nachhaltigkeit (mit Übung)</a>	2 SWS	Lecture / Practice (VÜ)	Walz
Exams					
WS 19/20	7900295	<a href="#">Environmental Economics and Sustainability</a>	Prüfung (PR)		Walz

**Competence Certificate**

See German version

**Prerequisites**

None

**Recommendation**

It is recommended to already have knowledge in the area of macro- and microeconomics. This knowledge may be acquired in the courses *Economics I: Microeconomics* [2600012] and *Economics II: Macroeconomics* [2600014].

T

**6.115 Course: Environmental Law [T-INFO-101348]**

**Responsible:** Dr. Tristan Barczak  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101217 - Public Business Law](#)  
[M-WIWI-101468 - Environmental Economics](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
WS 19/20	24140	<a href="#">Umweltrecht</a>	2 SWS	Lecture (V)	Barczak
Exams					
WS 19/20	7500050	<a href="#">Environmental Law</a>		Prüfung (PR)	Barczak
SS 2020	7500082	<a href="#">Environmental Law</a>		Prüfung (PR)	Eichenhofer

T

**6.116 Course: European and International Law [T-INFO-101312]**

**Responsible:** Ulf Brühann  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101217 - Public Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	24666	<a href="#">Europäisches und Internationales Recht</a>	2 SWS	Lecture (V)	Brühann
Exams					
WS 19/20	7500048	<a href="#">European and International Law</a>		Prüfung (PR)	Barczak
SS 2020	7500084	<a href="#">European and International Law</a>		Prüfung (PR)	Eichenhofer

## T

## 6.117 Course: Experimental Economics [T-WIWI-102614]

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101446 - Market Engineering](#)  
[M-WIWI-101453 - Applied Strategic Decisions](#)  
[M-WIWI-101505 - Experimental Economics](#)  
[M-WIWI-103118 - Data Science: Data-Driven User Modeling](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2540489	<a href="#">Experimental Economics</a>	2 SWS	Lecture (V)	Peukert, Dorner
WS 19/20	2540493	<a href="#">Übung zu Experimentelle Wirtschaftsforschung</a>	1 SWS	Practice (Ü)	Greif-Winzrieth, Pietruska
Exams					
WS 19/20	7900178	<a href="#">Experimental Economics</a>		Prüfung (PR)	Weinhardt
WS 19/20	7900194	<a href="#">Experimental Economics</a>		Prüfung (PR)	Weinhardt

**Competence Certificate**

The assessment consists of a written exam (60 min) (according to §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**

None

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

## V

**Experimental Economics**

2540489, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

- Strategische Spiele; S. Berninghaus, K.-M. Ehrhart, W. Güth; Springer Verlag, 2. Aufl. 2006.
- Handbook of Experimental Economics; J. Kagel, A. Roth; Princeton University Press, 1995.
- Experiments in Economics; J.D. Hey; Blackwell Publishers, 1991.
- Experimental Economics; D.D. Davis, C.A. Holt; Princeton University Press, 1993.
- Experimental Methods: A Primer for Economists; D. Friedman, S. Sunder; Cambridge University Press, 1994.

T

## 6.118 Course: Extraordinary additional course in the module Cross-Functional Management Accounting [T-WIWI-108651]

**Responsible:** Prof. Dr. Marcus Wouters  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101510 - Cross-Functional Management Accounting](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each term	1

### Competence Certificate

The assessment depends on which extraordinary course becomes part of the module "Cross-Functional Management Accounting".

.

### Prerequisites

None

### Annotation

The purpose of this placeholder is to make it possible to include an extraordinary course in the module "Cross-Functional Management Accounting". Proposals for specific courses have to be approved in advance by the module coordinator.

T

**6.119 Course: Financial Analysis [T-WIWI-102900]**

**Responsible:** Dr. Torsten Luedecke  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2530205	<a href="#">Financial Analysis</a>	2 SWS	Lecture (V)	Luedecke
SS 2020	2530206	<a href="#">Übungen zu Financial Analysis</a>	2 SWS	Practice (Ü)	Luedecke
Exams					
WS 19/20	7900059	<a href="#">Financial Analysis</a>		Prüfung (PR)	Luedecke, Ruckes

**Competence Certificate**

See German version.

**Prerequisites**

None

**Recommendation**

Basic knowledge in corporate finance, accounting, and valuation is required.

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

V

**Financial Analysis**2530205, SS 2020, 2 SWS, Language: English, [Open in study portal](#)**Lecture (V)****Literature**

- Alexander, D. and C. Nobes (2017): Financial Accounting – An International Introduction, 6th ed., Pearson.
- Penman, S.H. (2013): Financial Statement Analysis and Security Valuation, 5th ed., McGraw Hill.



T

**6.120 Course: Financial Econometrics [T-WIWI-103064]**

**Responsible:** Prof. Dr. Melanie Schienle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101638 - Econometrics and Statistics I](#)  
[M-WIWI-101639 - Econometrics and Statistics II](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	2

Events					
SS 2020	2520022	<a href="#">Financial Econometrics</a>	2 SWS	Lecture (V)	Schienle
SS 2020	2520023	<a href="#">Übungen zu Financial Econometrics I</a>	2 SWS	Practice (Ü)	Schienle, Görden

**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....

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

V

**Financial Econometrics**

2520022, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content****Learning objectives:**

The student

- shows a broad knowledge of financial econometric estimation and testing techniques
- is able to apply his/her technical knowledge using software in order to critically assess empirical problems

**Content:**

ARMA, ARIMA, ARFIMA, (non)stationarity, causality, cointegration, ARCH/GARCH, stochastic volatility models, computer based exercises

**Requirements:**

It is recommended to attend the course *Economics III: Introduction to Econometrics* [2520016] prior to this course.

**Workload:**

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

Exam preparation: 40 hours

**Literature**

Taylor, S. J. (2005): "Asset Price Dynamics, Volatility, and Prediction", Princeton University Press.

Tsay, R. S. (2005): "Analysis of Financial Time Series: Financial Econometrics", Wiley, 2nd edition.

Cochrane, J. H. (2005): "Asset Pricing", revised edition, Princeton University Press.

Campbell, J. Y., A. W. Lo, and A. C. MacKinlay (1997): "The Econometrics of Financial Markets", Princeton University Press.

Hamilton, J. D. (1994): "Time Series Analysis", Princeton University Press.

Additional literature will be discussed in the lecture.

## T

**6.121 Course: Financial Intermediation [T-WIWI-102623]**

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101453 - Applied Strategic Decisions](#)  
[M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)  
[M-WIWI-101502 - Economic Theory and its Application in Finance](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2530232	<a href="#">Financial Intermediation</a>	2 SWS	Lecture (V)	Ruckes
WS 19/20	2530233	<a href="#">Übung zu Finanzintermediation</a>	1 SWS	Practice (Ü)	Ruckes, Hoang, Benz
Exams					
WS 19/20	7900063	<a href="#">Financial Intermediation</a>		Prüfung (PR)	Ruckes

**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 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature****Weiterführende Literatur:**

- Hartmann-Wendels/Pfingsten/Weber (2014): Bankbetriebslehre, 6. Auflage, Springer Verlag.
- Freixas/Rochet (2008): Microeconomics of Banking, 2. Auflage, MIT Press.

T

**6.122 Course: Firm creation in IT security [T-WIWI-110374]**

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Irregular	1

Events					
WS 19/20	2545109	<a href="#">Basic concepts of Entrepreneurship in the area of IT security</a>	2 SWS	Seminar (S)	Ntagiakou, Kienzle
SS 2020	2545109	<a href="#">Basic concepts of Entrepreneurship in the area of IT security</a>	2 SWS	Seminar (S)	Ntagiakou, Kienzle, Terzidis
Exams					
WS 19/20	7900155	<a href="#">Firm creation in IT security</a>		Prüfung (PR)	Terzidis

**Competence Certificate**

Alternative exam assessment. The grade consists of the presentation and the written elaboration.

**Prerequisites**

None

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

V

**Basic concepts of Entrepreneurship in the area of IT security**

2545109, WS 19/20, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

**Content**

In order to identify opportunities, the participants should identify fields for entrepreneurial opportunities in a systematic web research. For this purpose, Systematic Mapping procedures will be adapted to the research of general web sources and applied to the research of interesting fields in the area of cyber security.

**Information about the seminar:**

In the seminar you will work in groups of max. 4 persons. Group applications are welcome but not a prerequisite for participation.

Some of the seminars will be held in English.

The focus of the seminar is Opportunity Recognition in the field of IT-Security, followed by ideation sessions with the aim to find possible applications for technologies that are developed at the KIT. Prototyping and also Pitching are part of the seminar.

**Target group:**

Master Students

**Information on the allocation of seminar places:**

The registration for the seminar is possible in the Wiwi portal in the period from 11.09.2019 to 05.10.2019 at 23:55 clock. To apply for the seminar, please send us a letter of motivation (max. 5 sentences).

**Seminar contents:**

- To identify opportunities, the participants should identify fields for entrepreneurial opportunities in a systematic web research. For this purpose, Systematic Mapping procedures will be adapted to the research of general web sources and applied to the research of interesting fields in the area of cyber security.
- All information will be discussed with experts on the second seminar day. The aim of the first two sessions is to develop a systematic segmentation of market needs.
- After the teams have been formed, the workshop "Technology Application Selection (TAS)" follows. This is a framework developed by EnTechnon that will help the teams to develop concrete business ideas based on given technologies. The three steps of the TAS will be the content of the third and fourth seminar days. Participants will generate ideas and then - based on specific criteria that we will provide - choose an idea on which they will build their value proposition.
- The final session before the final day will deal with prototyping and validation. This will use rapid prototyping and validation methods from the design thinking environment.
- On the last day - before their final presentations - the participants learn how to present the idea in a short presentation (pitch) to an interested audience.

**Basic concepts of Entrepreneurship in the area of IT security**

2545109, SS 2020, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

**Content**

In order to identify opportunities, the participants should identify fields for entrepreneurial opportunities in a systematic web research. For this purpose, Systematic Mapping procedures will be adapted to the research of general web sources and applied to the research of interesting fields in the area of cyber security.

**Information about the seminar:**

In the seminar you will work in groups of max. 4 persons. Group applications are welcome but not a prerequisite for participation.

Some of the seminars will be held in English.

The focus of the seminar is Opportunity Recognition in the field of IT-Security, followed by ideation sessions with the aim to find possible applications for technologies that are developed at the KIT. Prototyping and also Pitching are part of the seminar.

**Target group:**

Master Students

**Information on the allocation of seminar places:**

The registration for the seminar is possible in the Wiwi portal in the period from 11.09.2019 to 05.10.2019 at 23:55 clock. To apply for the seminar, please send us a letter of motivation (max. 5 sentences).

**Seminar contents:**

- To identify opportunities, the participants should identify fields for entrepreneurial opportunities in a systematic web research. For this purpose, Systematic Mapping procedures will be adapted to the research of general web sources and applied to the research of interesting fields in the area of cyber security.
- All information will be discussed with experts on the second seminar day. The aim of the first two sessions is to develop a systematic segmentation of market needs.
- After the teams have been formed, the workshop "Technology Application Selection (TAS)" follows. This is a framework developed by EnTechnon that will help the teams to develop concrete business ideas based on given technologies. The three steps of the TAS will be the content of the third and fourth seminar days. Participants will generate ideas and then - based on specific criteria that we will provide - choose an idea on which they will build their value proposition.
- The final session before the final day will deal with prototyping and validation. This will use rapid prototyping and validation methods from the design thinking environment.
- On the last day - before their final presentations - the participants learn how to present the idea in a short presentation (pitch) to an interested audience.

T

**6.123 Course: Fixed Income Securities [T-WIWI-102644]**

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2530260	<a href="#">Fixed Income Securities</a>	3 SWS	Lecture / Practice (VÜ)	Uhrig-Homburg, Mitarbeiter
Exams					
WS 19/20	7900053	<a href="#">Fixed Income Securities</a>		Prüfung (PR)	Uhrig-Homburg

**Competence Certificate**

The assessment takes place in the form of a written examination (75 minutes) according to §4(2), 1 SPO. The examination takes place during the semester break. 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 up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

**Prerequisites**

None

**Recommendation**

Knowledge from the course "Derivatives" is very helpful.

**Annotation**

The course is offered as a block course.

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

V

**Fixed Income Securities**

2530260, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

**Content**

The lecture deals with both German and international bond markets, which are an important source of funding for both the corporate and the public sector. After an overview of the most important bond markets, various definitions of return are discussed. Based on that, the concept of the yield curve is presented. The modelling of the dynamics of the term structure of interest rates provides the theoretical foundation for the valuation of interest rate derivatives, which is discussed in the last part of the lecture.

The objective of this course is to become familiar with national and international bond markets. Therefore, we first have a look at financial instruments that are of particular importance. Thereafter, specific models and methods that allow the evaluation of interest rate derivatives are introduced and applied.

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

The assessment consists of a written exam following §4, Abs. 2, 1.

- Bühler, W., Uhrig-Homburg, M., Rendite und Renditestruktur am Rentenmarkt, in Obst/Hintner, Geld-, Bank- und Börsenwesen - Handbuch des Finanzsystems, (2000), S.298-337.
- Sundaresan, S., Fixed Income Markets and Their Derivatives, Academic Press, 3rd Edition, (2009).

**Elective literature:**

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

**Literature**

- Bühler, W., Uhrig-Homburg, M., Rendite und Renditestruktur am Rentenmarkt, in Obst/Hintner, Geld-, Bank- und Börsenwesen - Handbuch des Finanzsystems, (2000), S.298-337.
- Sundaresan, S., Fixed Income Markets and Their Derivatives, Academic Press, 3rd Edition, (2009).

**Weiterführende Literatur:**

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



T

## 6.124 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	Recurrence	Version
Written examination	6	Each winter term	1

Events					
WS 19/20	24086	<a href="#">Formale Systeme</a>	4 SWS	Lecture / Practice (VÜ)	Beckert, Ulbrich
Exams					
WS 19/20	7500036	<a href="#">Formal Systems</a>		Prüfung (PR)	Beckert
SS 2020	7500009	<a href="#">Formal Systems</a>		Prüfung (PR)	Beckert

T

**6.125 Course: Formal Systems II: Application [T-INFO-101281]**

**Responsible:** Prof. Dr. Bernhard Beckert  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100744 - Formal Systems II: Application](#)  
[M-INFO-101201 - Software Systems](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each summer term	1

T

## 6.126 Course: Formal Systems II: Theory [T-INFO-101378]

**Responsible:** Prof. Dr. Bernhard Beckert  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100841 - Formal Systems II: Theory](#)  
[M-INFO-101201 - Software Systems](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each summer term	1

Events					
SS 2020	24608	<a href="#">Formale Systeme II - Theorie</a>	3 SWS	Lecture (V)	Beckert, Ulbrich
Exams					
SS 2020	7500129	<a href="#">Formal Systems II: Theory</a>		Prüfung (PR)	Beckert

T

**6.127 Course: Geometric Optimization [T-INFO-101267]**

**Responsible:** Prof. Dr. Hartmut Prautzsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100730 - Geometric Optimization](#)

Type	Credits	Recurrence	Version
Oral examination	3	Irregular	1

Events					
SS 2020	2400029	<a href="#">Geometrische Optimierung</a>	2 SWS	Lecture (V)	Prautzsch

T

**6.128 Course: Global Optimization I [T-WIWI-102726]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Exams				
WS 19/20	7900005_WS1920_NK	<a href="#">Global Optimization I</a>	Prüfung (PR)	Stein

**Competence Certificate**

Please note: due to the research semester of Prof. Dr. Stein the lecture will not be offered in summer semester 2020.

Success is in the form of a written examination (60 min.) (according to § 4(2), 1 SPO).

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.

T

**6.129 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-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	9	Each summer term	1

Exams				
WS 19/20	7900007_WS1920_NK	<a href="#">Global Optimization I and II</a>	Prüfung (PR)	Stein

**Competence Certificate**

Please note: due to the research semester of Prof. Dr. Stein the lectures will not be offered in summer semester 2020.

The assessment of the lecture is a written examination (120 minutes) according to §4(2), 1 of the examination regulation.

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.

T

**6.130 Course: Global Optimization II [T-WIWI-102727]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Exams				
WS 19/20	7900006_WS1920_NK	<a href="#">Global Optimization II</a>	Prüfung (PR)	Stein

**Competence Certificate**

Please note: due to the research semester of Prof. Dr. Stein the lecture will not be offered in summer semester 2020.

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation.

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.

T

**6.131 Course: Graph Theory and Advanced Location Models [T-WIWI-102723]**

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)  
[M-WIWI-102832 - Operations Research in Supply Chain Management](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	2

Exams				
WS 19/20	7900287	<a href="#">Graph Theory and Advanced Location Models</a>	Prüfung (PR)	Nickel

**Competence Certificate**

The assessment is a 60 minutes written examination (according to §4(2), 1 of the examination regulation).

The examination is held in the term of the lecture and the following lecture.

**Prerequisites**

None

**Recommendation**

Basic knowledge as conveyed in the module "Introduction to Operations Research" is assumed.

**Annotation**

The course is offered irregularly. Planned lectures for the next three years can be found in the internet at <http://dol.ior.kit.edu/english/Courses.php>.



T

**6.132 Course: Heat Economy [T-WIWI-102695]**

**Responsible:** Prof. Dr. Wolf Fichtner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101452 - Energy Economics and Technology](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Exams				
WS 19/20	7981001	<a href="#">Heat Economy</a>	Prüfung (PR)	Fichtner

**Competence Certificate**

The lecture will be suspended in summer semester 2019 and 2020 and will probably be offered again in summer semester 2021.  
 The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

**Prerequisites**

None.

**Recommendation**

None

**Annotation**

See German version.

## T

## 6.133 Course: Human Factors in Security and Privacy [T-WIWI-109270]

**Responsible:** Prof. Dr. Melanie Volkamer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-104520 - Human Factors in Security and Privacy](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	2

Exams				
WS 19/20	7900113	<a href="#">Human Factors in Security and Privacy</a>	Prüfung (PR)	Volkamer
SS 2020	7900084	<a href="#">Human Factors in Security and Privacy (Registration until 13 July 2020)</a>	Prüfung (PR)	Volkamer

**Competence Certificate**

The lecture will not be offered in the winter semester 2019/2020.

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.

**Prerequisites**

Successful participation in the exercises.

**Recommendation**

The prior attendance of the lecture "Information Security" is strongly recommended.

T

**6.134 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	Recurrence	Version
Written examination	6	Each summer term	2

Events					
SS 2020	24659	<a href="#">Human-Computer-Interaction</a>	2 SWS	Lecture (V)	Exler, Beigl
Exams					
WS 19/20	7500076	<a href="#">Human-Machine-Interaction</a>		Prüfung (PR)	Beigl
SS 2020	7500048	<a href="#">Human-Machine-Interaction</a>		Prüfung (PR)	Beigl

T

## 6.135 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	Recurrence	Version
Completed coursework	0	Each summer term	1

Events					
SS 2020	2400095	<a href="#">Human-Computer-Interaction</a>	1 SWS	Practice (Ü)	Beigl, Exler
SS 2020	24659	<a href="#">Human-Computer-Interaction</a>	2 SWS	Lecture (V)	Exler, Beigl
Exams					
SS 2020	7500121	<a href="#">Human-Machine-Interaction</a>		Prüfung (PR)	Beigl

T

**6.136 Course: Image Data Compression [T-INFO-101292]**

**Responsible:** Prof. Dr.-Ing. Jürgen Beyerer  
Dr. Alexey Pak

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-100755 - Image Data Compression](#)  
[M-INFO-101239 - Machine Vision](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each winter term	1

Events					
WS 19/20	2400112	<a href="#">Image Data Compression</a>	2 SWS	Lecture (V)	Beyerer, Pak
Exams					
WS 19/20	7500013	<a href="#">Image Data Compression</a>		Prüfung (PR)	Beyerer
SS 2020	7500002	<a href="#">Image Data Compression</a>		Prüfung (PR)	Beyerer

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

V

**Image Data Compression**2400112, WS 19/20, 2 SWS, [Open in study portal](#)

Lecture (V)

**Content**

This module conveys to the students the theoretical and practical aspects of the principal stages in image data acquisition and compression. The discussion progresses from the coding of un-correlated sequential data streams to de-correlation of natural 2D images and to exploitation of temporal correlations in video data coding. Each considered technique is provided with a statistical justification and characterised with basic information-theoretic metrics.

In the end of the class, an outlook is given to non-conventional image-based information coding schemes (watermarking and steganography).

**Educational objective:**

The students will learn various kinds, sources, and uses of image-type data, and the forms of their compression. Students master the basic concepts of information theory, related to data communication and coding. Based on these concepts and general principles and characterization criteria, students are able to compare various schemes of image data representation and coding. Students have in-depth knowledge of a few selected algorithms of entropy coding, pre-coding, and 1D-signal de-correlation.

Students know 2D transform-based de-correlation methods, including Discrete Fourier Transform, Discrete Cosine Transform, Walsh-Hadamard Transform, and the Discrete Wavelet Transform and know how to use them in video coding by exploitation of temporal correlations.

Students understand the human visual system and the statistics of natural images. In addition, the students know two non-standard applications of image data coding: digital watermarking and steganography. As an exercise, students analyze several simple steganographic schemes.

T

**6.137 Course: Incentives in Organizations [T-WIWI-105781]**

**Responsible:** Prof. Dr. Petra Nieken  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101453 - Applied Strategic Decisions](#)  
[M-WIWI-101500 - Microeconomic Theory](#)  
[M-WIWI-101505 - Experimental Economics](#)  
[M-WIWI-101510 - Cross-Functional Management Accounting](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2573003	<a href="#">Incentives in Organizations</a>	2 SWS	Lecture (V)	Nieken
SS 2020	2573004	<a href="#">Übung zu Incentives in Organizations</a>	2 SWS	Practice (Ü)	Nieken, Mitarbeiter
Exams					
WS 19/20	7900201	<a href="#">Incentives in Organizations</a>		Prüfung (PR)	Nieken

**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.

In case of a small number of registrations, we might offer an oral exam instead of a written exam.

**Prerequisites**

None

**Recommendation**

Knowledge of microeconomics, game theory, and statistics is assumed.

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

V

**Incentives in Organizations**

2573003, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

The students acquire profound knowledge about the design and the impact of different incentive and compensation systems. Topics covered are, for instance, performance based compensation, team work, intrinsic motivation, multitasking, and subjective performance evaluations. We will use microeconomic or behavioral models as well as empirical data to analyze incentive systems. We will investigate several widely used compensation schemes and their relationship with corporate strategy. Students will learn to develop practical implications which are based on the acquired knowledge of this course.

**Aim**

The student

- develops a strategic understanding about incentives systems and how they work.
- analyzes models from personnel economics.
- understands how econometric methods can be used to analyze performance and compensation data.
- knows incentive schemes that are used in companies and is able to evaluate them critically.
- can develop practical implications which are based on theoretical models and empirical data from companies.
- understands the challenges of managing incentive and compensation systems and their relationship with corporate strategy.

**Workload**

The total workload for this course is: approximately 135 hours.

Lecture: 32h

Preparation of lecture: 52h

Exam preparation: 51h

**Literature**

Slides

Additional case studies and research papers will be announced in the lecture.

T

**6.138 Course: Industrial Services [T-WIWI-102822]**

**Responsible:** Prof. Dr. Hansjörg Fromm  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101448 - Service Management](#)  
[M-WIWI-101506 - Service Analytics](#)  
[M-WIWI-102808 - Digital Service Systems in Industry](#)

Type	Credits	Recurrence	Version
Written examination	4,5	see Annotations	1

Events					
WS 19/20	2595505	<a href="#">Industrial Services</a>	2 SWS	Lecture (V)	Fromm
WS 19/20	2595506	<a href="#">Übungen zu Industrial Services</a>	1 SWS	Practice (Ü)	Walk
Exams					
WS 19/20	7900241	<a href="#">Industrial Services</a>		Prüfung (PR)	Fromm

**Competence Certificate**

For students taking the exam for the first time, the exam will be offered for the last time in summer semester 2020.

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

The lecture is no longer offered.

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

V

**Industrial Services**

2595505, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)



### Content

Services are becoming ever more important in business. Today, the gross income share of services in Germany exceeds 70%. Following this trend, many companies that previously focused solely on the sale of goods, strive to an extension of their business model: In order to realize new competitive advantages in domestic and international markets, they enrich their material goods with customer-specific services. This transformation to a provider of integrated solutions is called "Servitization" (Neely 2009). For this reason, so-called industrial services to companies of increasing importance. They benefit from the increasingly detailed data collected (on "Big Data"), e.g. concerning user profiles, failure statistics, usage history, accrued expenses, etc. Only these data allow in principle to end products and spare parts are delivered faster, cheaper and more targeted and technicians can be used more efficiently with the correct skills. This requires, however, also suitable methods of optimization, prognosis or predictive modeling. When used properly, such methods can minimize logistics costs, increase availability, prevent potential failures and improve repair planning. This is also enabled by latest "Technology Enabled Services" along with corresponding data transfer and analysis ("Internet of Things", automatic error detection, remote diagnostics, centralized collection of consumption data, etc.). The change from goods manufacturer to a provider of integrated solutions requires new services, transformation of business models as well as intelligent new contract types, which are addressed in the course as well.

**More specifically, the lessons of this lecture will include:**

- Servitization – The Manufacturer's Transformation to Integrated Solution Provider
- The "Services Supply Chain"
- Spare Parts Planning – Forecasting, Assortment Planning, Order Quantities and Safety Stocks
- Distribution Network Planning – Network Types, Models, Optimization
- Service Technician Planning
- Condition Monitoring, Predictive Maintenance, Diagnose Systems
- Call Center Services
- Full Service Contracts
- IT-enabled Value-Added Services – Industrial Service Innovation

### Learning Goals:

Participants understand the interrelation between Front-Office (Customer view, e.g. material availability, technician skills, maintenance quality, repair time) and Back-Office (Provider view, e.g. distribution planning, inventory optimization, technician work schedule, call center). They learn about forecasting algorithms for sporadic demands, which are typical in spare part supply, and they apply common inventory optimization models for stock planning. They also become familiar with full-cost service contracts, as well as with the latest product-related services that have been enabled only in recent years by modern IT and mobile technology.

**Update March 2020: The lecture was offered the last time in the winter term 2019/20. The exam in the summer term 2020 is still open to all students. The exam in the winter term 2020/21 is only open to students that previously failed the exam.**

### Literature

Silver, E. A., Pyke, D. F., & Peterson, R. (1998). *Inventory management and production planning and scheduling* (Vol. 3, p. 30). New York: Wiley.

Pintelon, L., & Van Puyvelde, F. (2013). *Asset Management. The Maintenance Perspective*. Acco.

Chopra, S., & Meindl, P. (2007). Supply chain management. Strategy, planning & operation. In *Das summa summarum des management* (pp. 265-275). Gabler.

Koole, G. (2007). Call Center Mathematics: A scientific method for understanding and improving contact centers. *Departement of Mathematics, Vrije Universiteit, Amsterdam*.

Oliva, R., & Kallenberg, R. (2003). Managing the transition from products to services. *International journal of service industry management*, 14(2), 160-172.

T

**6.139 Course: Information Service Engineering [T-WIWI-106423]**

**Responsible:** Prof. Dr. Harald Sack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101456 - Intelligent Systems and Services](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Events					
SS 2020	2511606	<a href="#">Information Service Engineering</a>	2 SWS	Lecture (V)	Sack
SS 2020	2511607	<a href="#">Exercises to Information Service Engineering</a>	1 SWS	Practice (Ü)	Sack
Exams					
WS 19/20	7900071	<a href="#">Information Service Engineering</a>		Prüfung (PR)	Sack
SS 2020	7900070	<a href="#">Information Service Engineering (Registration until 13 July 2020)</a>		Prüfung (PR)	Sack

**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 (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

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

V

**Information Service Engineering**

2511606, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

- Information, Natural Language and the Web

- Natural Language Processing

- NLP and Basic Linguistic Knowledge
- NLP Applications, Techniques & Challenges
- Evaluation, Precision and Recall
- Regular Expressions and Automata
- Tokenization
- Language Model and N-Grams
- Part-of-Speech Tagging

- Knowledge Graphs

- Knowledge Representations and Ontologies
- Resource Description Framework (RDF) as simple Data Model
- Creating new Models with RDFS
- Querying RDF(S) with SPARQL
- More Expressivity via Web Ontology Language (OWL)
- From Linked Data to Knowledge Graphs
- Wikipedia, DBpedia, and Wikidata
- Knowledge Graph Programming

- Basic Machine Learning

- Machine Learning Fundamentals
- Evaluation and Generalization Problems
- Linear Regression
- Decision Trees
- Unsupervised Learning
- Neural Networks and Deep Learning

- ISE Applications

- From Data to Knowledge
- Data Mining, Information Visualization and Knowledge Discovery
- Semantic Search
- Exploratory Search
- Semantic Recommender Systems

**Learning objectives:**

- The students know the fundamentals and measures of information theory and are able to apply those in the context of Information Service Engineering.
- The students have basic skills of natural language processing and are enabled to apply natural language processing technology to solve and evaluate simple text analysis tasks.
- The students have fundamental skills of knowledge representation with ontologies as well as basic knowledge of Semantic Web and Linked Data technologies. The students are able to apply these skills for simple representation and analysis tasks.
- The students have fundamental skills of information retrieval and are enabled to conduct and to evaluate simple information retrieval tasks.
- The students apply their skills of natural language processing, Linked Data engineering, and Information Retrieval to conduct and evaluate simple knowledge mining tasks.
- The students know the fundamentals of recommender systems as well as of semantic and exploratory search.

**Literature**

- D. Jurafsky, J.H. Martin, Speech and Language Processing, 2nd ed. Pearson Int., 2009.
- S. Hitzler, S. Rudolph, Foundations of Semantic Web Technologies, Chapman / Hall, 2009.
- R. Baeza-Yates, B. Ribeiro-Neto, Modern Information Retrieval, 2nd ed., Addison Wesley, 2010.
- S. Marsland, Machine Learning - An Algorithmic Perspective, 2nd ed., CRC Press, 2015

T

## 6.140 Course: Innovation Management: Concepts, Strategies and Methods [T-WIWI-102893]

**Responsible:** Prof. Dr. Marion Weissenberger-Eibl  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	2545100	<a href="#">Innovation Management: Concepts, Strategies and Methods</a>	2 SWS	Lecture (V)	Weissenberger-Eibl
Exams					
SS 2020	7900144	<a href="#">Innovation Management: Concepts, Strategies and Methods</a>		Prüfung (PR)	Weissenberger-Eibl
SS 2020	7900145	<a href="#">Innovation Management: Concepts, Strategies and Methods</a>		Prüfung (PR)	Weissenberger-Eibl

### Competence Certificate

The assessment consists of a written exam (60 minutes). The exam takes place in every summer semester. Re-examinations are offered at every ordinary examination date.

### Prerequisites

None

### Recommendation

None

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

V

## Innovation Management: Concepts, Strategies and Methods

2545100, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

The course 'Innovation Management: Concepts, Strategies and Methods' offers scientific concepts which facilitate the understanding of the different phases of the innovation process and resulting strategies and appropriate methodologies suitable for application. The concepts refer to the entire innovation process so that an integrated perspective is made possible. This is the basis for the teaching of strategies and methods which fulfil the diverse demands of the complex innovation process. The course focuses particularly on the creation of interfaces between departments and between various actors in a company's environment and the organisation of a company's internal procedures. In this context a basic understanding of knowledge and communication is taught in addition to the specific characteristics of the respective actors. Subsequently methods are shown which are suitable for the profitable and innovation-led implementation of integrated knowledge.

**Aim:** Students develop a differentiated understanding of the different phases and concepts of the innovation process, different strategies and methods in innovation management.

### Literature

Eine ausführliche Literaturliste wird mit den Vorlesungsunterlagen zur Verfügung gestellt.

Eine Einführung bei: Vahs,D./Brem,A. (2013): Innovationsmanagement. Von der Idee zur erfolgreichen Vermarktung, 4. Auflage, Stuttgart 2013.

T

**6.141 Course: Innovation Processes Live [T-WIWI-110234]**

**Responsible:** Dr. Daniela Beyer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101507 - Innovation Management](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Irregular	1

Exams				
WS 19/20	7900141	<a href="#">Innovation Processes Live</a>	Prüfung (PR)	Weissenberger-Eibl

**Competence Certificate**

Alternative exam assessments (§4(2), 3 SPO). The grade consists of an exposé (15%), a guideline interview or an analysis tool (25%), a group presentation of the results (20%) and a seminar paper (40%).

**Prerequisites**

None.

**Recommendation**

Prior attendance of the course Innovation Management [2545015] is recommended.

## T

## 6.142 Course: Innovation Theory and Policy [T-WIWI-102840]

**Responsible:** Prof. Dr. Ingrid Ott  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101478 - Innovation and Growth](#)  
[M-WIWI-101514 - Innovation Economics](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2560236	<a href="#">Innovationtheory and -policy</a>	SWS	Lecture (V)	Ott
SS 2020	2560237		1 SWS	Practice (Ü)	Ott, Eraydin

**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. Re-examinations are offered at every ordinary examination date.

A bonus can be earned through a short written homework and its presentation in the exercise. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by a maximum of 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 micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required.

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

## V

**Innovationtheory and -policy**

2560236, SS 2020, SWS, Language: German/English, [Open in study portal](#)

Lecture (V)

**Content****Learning objectives:**

Students shall be given the ability to

- identify the importance of alternative incentive mechanisms for the emergence and dissemination of innovations
- understand the relationships between market structure and the development of innovation
- explain, in which situations market interventions by the state, for example taxes and subsidies, can be legitimized, and evaluate them in the light of economic welfare

**Course content:****The course covers the following topics:**

- Incentives for the emergence of innovations
- Patents
- Diffusion
- Impact of technological progress
- Innovation Policy

**Recommendations:**

Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required.

**Workload:**

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

**Exam description:**

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. Re-examinations are offered at every ordinary examination date.

Students will be given the opportunity of writing and presenting a short paper during the lecture time to achieve a bonus on the exam grade. If the mandatory credit point exam is passed, the awarded bonus points will be added to the regular exam points. A deterioration is not possible by definition, and a grade does not necessarily improve, but is very likely to (not every additional point improves the total number of points, since a grade can not become better than 1). The voluntary elaboration of such a paper can not countervail a fail in the exam.

**Literature****Auszug:**

- Aghion, P., Howitt, P. (2009), *The Economics of Growth*, MIT Press, Cambridge MA.
- de la Fuente, A. (2000), *Mathematical Methods and Models for Economists*. Cambridge University Press, Cambridge, UK.
- Klodt, H. (1995), *Grundlagen der Forschungs- und Technologiepolitik*. Vahlen, München.
- Linde, R. (2000), *Allokation, Wettbewerb, Verteilung - Theorie*, UNIBUCH Verlag, Lüneburg.
- Ruttan, V. W. (2001), *Technology, Growth, and Development*. Oxford University Press, Oxford.
- Scotchmer, S. (2004), *Incentives and Innovation*, MIT Press.
- Tirole, Jean (1988), *The Theory of Industrial Organization*, MIT Press, Cambridge MA.

T

## 6.143 Course: Integrated Network and Systems Management [T-INFO-101284]

**Responsible:** Prof. Dr. Bernhard Neumair  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101210 - Dynamic IT-Infrastructures](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2020	2400004	<a href="#">Integrated Network and Systems Management</a>	2 SWS	Lecture (V)	Neumair



T

## 6.144 Course: Intelligent Agents and Decision Theory [T-WIWI-110915]

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101470 - Data Science: Advanced CRM](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2540537	<a href="#">Intelligent Agents and Decision Theory</a>	SWS	Lecture (V)	Geyer-Schulz
SS 2020	2540538	<a href="#">Übung zu Intelligent Agents and Decision Theory</a>	SWS	Practice (Ü)	Schweizer

### Competence Certificate

Oral (30 minutes) or written examination (60 minutes). The exam is held in each semester and can be repeated at any regular examination date. Details of the grading system and any exam bonus that may be achieved from the practice are announced in the course.

### Prerequisites

None

### Recommendation

We assume knowledge in statistics, operations research and microeconomics as taught in the Bachelor program (VWL I, Operations Research I + II, Statistics I + II) and a familiarity with preferably the Python programming language.

### Annotation

new lecture starting summer semester 2020

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

V

## Intelligent Agents and Decision Theory

2540537, SS 2020, SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

The key assumption of this lecture is that the concept of artificial intelligence is inseparably linked to the economic concept of rationality of agents. We consider different classes of decision problems - decisions under certainty, risk and uncertainty - from an economic, managerial and AI-engineering perspective:

From an economic point of view, we analyze how to act rationally in these situations based on classic utility theory. In this regard, the course also introduces the relevant parts of decision theory for dealing with

- multiple conflicting objectives,
- incomplete, risky and uncertain information about the world,
- assessing utility functions, and
- quantifying the value of information ...

From an engineering perspective, we discuss how to develop practical solutions for these decision problems, using appropriate AI components. We introduce

- a general, agent-based design framework for AI systems,

as well as AI methods from the fields of

- search (for decisions under certainty),
- inference (for decisions under risk) and
- learning (for decisions under uncertainty).

Where applicable, the course highlights the theoretical ties of these methods with decision theory.

We conclude with a discussion of ethical and philosophical issues concerning the development and use of AI.

**Learning objectives**

Students are able to design, analyze, implement, and evaluate intelligent agents.

**Lecture Outline**

1. Introduction: Artificial intelligence and the economic concept of rationality
2. Intelligent Agents: A general, agent-based design framework for AI systems
3. Decision under certainty: Assessing utility functions for decisions with multiple objectives
4. Search: Linear programming for decisions under certainty
5. Decisions under risk: The expected utility principle
6. Information systems: Improving economic decisions under risk
7. Inference: Bayesian networks for decisions under risk
8. Information Learning objectives value: When should an agent gather new information?
9. Decisions under uncertainty: Complete lack of information
10. Learning: Statistical learning of bayesian networks
11. Learning: Supervised learning with neural networks
12. Learning: Reinforcement learning
13. Learning: Preference-based reinforcement learning
14. Discussion: Ethical and philosophical issues

Note: This rough outline may be subject to change.

**Literature****Basic literature (by lecture):**

1. Russell & Norvig (2016, chapter 1), Bamberg et al. (2019, chapters 1 & 2)
2. Russell & Norvig (2016, chapter 2)
3. Keeney & Raiffa (1993, chapter 3)
4. Nickel et al. Chap 1 (German), Russell & Norvig (2016, chapter 3)
5. Bamberg et al. (2019, chapter 4), Fishburn (1988)
6. Bamberg et al. (2019, chapter 6)
7. Russell & Norvig (2016, chapters 13, 14, 16)
8. Russell & Norvig (2016, chapter 16), Bamberg et al. (2019, chapter 6)
9. Bamberg et al. (2019, chapter 5)
10. Russell & Norvig (2016, chapter 20)
11. Goodfellow et al. (2016, chapter 6)
12. Sutton & Barto (2018, chapter 3)
13. Wirth et al. (2017)
14. Russell & Norvig (2016, chapter 26)

**Detailed references:**

Bamberg, Coenenberg & Krapp (2019). Betriebswirtschaftliche Entscheidungslehre (16th ed.). Verlag Franz Vahlen GmbH.

Fishburn (1988). Nonlinear preference and utility theory. Baltimore: Johns Hopkins University Press.

Goodfellow, Bengio & Courville (2016). Deep learning. Cambridge: MIT press.

Keeney & Raiffa (1993). Decisions with multiple objectives: preferences and value trade-offs. Cambridge University Press.

Russell & Norvig (2016). Artificial Intelligence: A Modern Approach (3rd Global Edition). Pearson.

Sutton & Barto (2018). Reinforcement learning: An introduction. Cambridge: MIT press.

Wirth, Akrou, Neumann & Fürnkranz (2017). A Survey of Preference-Based Reinforcement Learning Methods. Journal of Machine Learning Research, 18(1), 1-46.

T

## 6.145 Course: Intelligent CRM Architectures [T-WIWI-103549]

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101470 - Data Science: Advanced CRM](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	3

Events					
WS 19/20	2540525	<a href="#">Intelligent CRM Architectures</a>	2 SWS	Lecture (V)	Geyer-Schulz
WS 19/20	2540526	<a href="#">Übung zu Intelligent CRM Architectures</a>	1 SWS	Practice (Ü)	Nazemi
Exams					
WS 19/20	79011480	<a href="#">Intelligent CRM Architectures</a>		Prüfung (PR)	Geyer-Schulz

### Competence Certificate

This lecture will be offered for the last time in winter semester 2019/20.

Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.

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

### Prerequisites

None

### Recommendation

It is recommended to additionally review the Bachelor-level lecture "Customer Relationship Management" from the module "CRM and Servicemanagement".

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

V

### Intelligent CRM Architectures

2540525, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content****Course content:**

The lecture is structured in three parts:

In the first part the methods used for architecture design are introduced (system analysis, UML, formal specification of interfaces, software and analysis patterns, and the separation in conceptual and IT-architectures. The second part is dedicated to learning architectures and machine learning methods. The third part presents examples of learning CRM-Architectures.

**Workload:**

The total workload for this course is approximately 135 hours (4.5 credits):

Time of attendance

- Attending the lecture: 15 x 90min = 22h 30m
- Attending the exercise classes: 7 x 90min = 10h 30m
- Examination: 1h 00m

Self-study

- Preparation and wrap-up of the lecture: 15 x 180min = 45h 00m
- Preparing the exercises: 25h 00m
- Preparation of the examination: 31h 00m

**Sum: 135h 00m**

**Learning Goals:**

Students have special knowledge of software architectures and of the methods which are used in their development (Systems analysis, formal methods for the specification of interfaces and algebraic semantic, UML, and, last but not least, the mapping of conceptual architectures to IT architectures.

Students know important architectural patterns and they can – based on their CRM knowledge – combine these patterns for innovative CRM applications.

**Assessment:**

The assessment consists of a written exam of 1-hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.

The course is considered successfully taken if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 10) from exercise work will be added.

**Grade: Minimum points**

- 1,0: 95
- 1,3: 90
- 1,7: 85
- 2,0: 80
- 2,3: 75
- 2,7: 70
- 3,0: 65
- 3,3: 60
- 3,7: 55
- 4,0: 50
- 5,0: 0

The grade consists of approximately 91% of exam points and 9% of exercise points.

**Literature**

- P. Clements u. a., *Documenting Software Architectures. Views and Beyond*. Upper Saddle River: Addison-Wesley, 2011.
- Fowler, *Patterns of Enterprise Application Architecture*. Amsterdam: Addison-Wesley Longman, 2002.
- S. Russell und P. Norvig, *Artificial Intelligence: A Modern Approach*, 3. Aufl. Harlow Essex England: Pearson New International Edition, 2014.
- V. N. Vapnik, *The Nature of Statistical Learning Theory*. New York: Springer, 1995.

T

**6.146 Course: International Finance [T-WIWI-102646]**

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	2530570	<a href="#">International Finance</a>	2 SWS	Lecture (V)	Walter, Uhrig-Homburg
Exams					
WS 19/20	7900052	<a href="#">International Finance</a>		Prüfung (PR)	Uhrig-Homburg

**Competence Certificate**

See German version.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

See German version.

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

V

**International Finance**2530570, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature****Weiterführende Literatur:**

- Eiteman, D. et al., Multinational Business Finance, 13. Auflage, 2012.
- Solnik, B. und D. McLeavey, Global Investments, 6. Auflage, 2008.

T

## 6.147 Course: International Management in Engineering and Production [T-WIWI-102882]

**Responsible:** Dr. Henning Sasse  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101412 - Industrial Production III](#)  
[M-WIWI-101471 - Industrial Production II](#)

Type	Credits	Recurrence	Version
Written examination	3,5	Each winter term	1

Events					
WS 19/20	2581956	<a href="#">International Management in Engineering and Production</a>	2 SWS	Lecture (V)	Sasse
Exams					
WS 19/20	7981956	<a href="#">International Management in Engineering and Production</a>		Prüfung (PR)	Schultmann

### Competence Certificate

The examination will be in form of a written exam acc. to §4(2), 1 ER. Exams are offered in every semester and can be re-examined at every ordinary examination date.

### Prerequisites

None

### Recommendation

None

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

V

## International Management in Engineering and Production

2581956, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Content

- Fundamentals of international business
- Forms of international cooperation and value creation
- Site selection
- Cost driven internationalization and site selection
- Sales and customer driven internationalization and site selection
- Challenges, risks and risk mitigation
- Management of international production sites
- Types and case studies of international production

### Literature

Wird in der Veranstaltung bekannt gegeben.

T

## 6.148 Course: International Selling – EUCOR [T-WIWI-110381]

**Responsible:** Erice Casenave  
Prof. Dr. Martin Klarmann

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

**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Once	1

Events					
WS 19/20	2572179	<a href="#">International Selling – EUCOR</a>	2 SWS	Block (B)	Klarmann
Exams					
WS 19/20	7900298	<a href="#">International Selling – EUCOR</a>		Prüfung (PR)	Klarmann

### Competence Certificate

Non exam assessment according to § 4 paragraph 2 Nr. 3 of the examination regulation (presentation). The grade is based on the presentation and the subsequent discussion.

### Prerequisites

The courses "Business Planning for Founders - EUCOR" and the course "International Selling - EUCOR" must be taken together.

### Annotation

An application is required to participate in this course. The application phase usually takes place at the beginning of the lecture period. Further information on the application process can be found on the website of the Marketing and Sales Research Group ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)) shortly before the start of the lecture period.

Please note that the courses "Business Planning for Founders - EUCOR" (3 ECTS) and "International Selling - EUCOR" (3 ECTS) can only be taken together (6 ECTS in total). In combination with the mandatory course "Sales Management and Retailing" (3 ECTS) the module is completed.

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

V

## International Selling – EUCOR

2572179, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Block (B)

### Content

This course is offered as part of the EUCOR programme in cooperation with EM Strasbourg. Max. 10 students of KIT and max. 10 students of EM Strasbourg will develop a sales presentation in tandems (teams of 2). This is based on the value proposition of a business model developed in the LV "Business Planning for Founders - EUCOR".

- An application is required to participate in this event. The application phase usually takes place at the beginning of the lecture period. Further information on the application process can be found on the website of the Marketing and Sales Research Group ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)) shortly before the start of the lecture period.
- Please note that the courses "Business Planning for Founders - EUCOR" (3 ECTS) and "International Selling - EUCOR" (3 ECTS) can only be taken together (6 ECTS in total). In combination with the mandatory course "Sales Management and Retailing" (3 ECTS) the module is completed.

Total workload for 3 ECTS: about 90 hours.



## T 6.149 Course: Internet Law [T-INFO-101307]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101215 - Intellectual Property Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	2

Events					
WS 19/20	24354	<a href="#">Internet Law</a>	2 SWS	Lecture (V)	Dreier
Exams					
WS 19/20	7500060	<a href="#">Internet Law</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500057	<a href="#">Internet Law</a>		Prüfung (PR)	Dreier, Matz

T

**6.150 Course: Internet of Everything [T-INFO-101337]**

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101203 - Wireless Networking](#)  
[M-INFO-101205 - Future Networking](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each winter term	1

Events					
WS 19/20	24104	<a href="#">Internet of Everything</a>	2 SWS	Lecture (V)	Zitterbart, Friebe, Jung
Exams					
WS 19/20	7500009	<a href="#">Internet of Everything</a>		Prüfung (PR)	Zitterbart
WS 19/20	7500249	<a href="#">Internet of Everything für Wiederholer</a>		Prüfung (PR)	Zitterbart

T

## 6.151 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](#)

Type	Credits	Recurrence	Version
Written examination	4	Each summer term	1

Events					
SS 2020	24519	<a href="#">Einführung in Rechnernetze</a>	2 SWS	Lecture (V)	Friebe, Jung, Schneider, Zitterbart
SS 2020	24521	<a href="#">Übung zu Einführung in Rechnernetze</a>	1 SWS	Practice (Ü)	Friebe, Jung, Schneider, Zitterbart
Exams					
WS 19/20	7500201	<a href="#">Introduction to Computer Networking</a>		Prüfung (PR)	Zitterbart

T

**6.152 Course: Introduction to Bayesian Statistics for Analyzing Data [T-WIWI-110918]**

**Responsible:** Benjamin Scheibehenne  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103117 - Data Science: Data-Driven Information Systems](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Once	1

Events					
SS 2020	2572175	<a href="#">Introduction to Bayesian Statistics for Analyzing Data</a>	2 SWS	Lecture (V)	Scheibehenne

**Competence Certificate**

Grades will be based on active participation (50%) and homework assignments (50%).

**Prerequisites**

Participants should already have a basic knowledge of R and standard frequentist statistical tests. Please bring your own Laptop with you as we will be using R for several hands-on examples and exercises during the class. We will mainly work with the book "Statistical Rethinking. A Bayesian Course with Examples in R and Stan" by Richard McElrath. Students are advised to obtain the book before the class starts.

**Annotation**

Due to its interactive nature, participation will be limited to 10 students. If you want to participate, please send a short email to [scheibehenne@kit.edu](mailto:scheibehenne@kit.edu) until Thursday, the 23rd of April in which you outline why you are interested in this class and what your expectations are.

The class will consist of three day-long sessions from 9:00 (s.t.) to 18:00. The first session will be held on Thursday, the 7th of May 2020. The second session will be on Thursday, the 28th of May. The third session will be on Thursday, the 18th of June. The classroom will be communicated to registered students in advance. In case classrooms will be closed due to the Corona virus, the class will be taught online and the schedule will be adapted.

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

V

**Introduction to Bayesian Statistics for Analyzing Data**

2572175, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content****Goal**

The goal of this class is to introduce Bayesian statistics as a viable alternative to conventional Null-Hypothesis significance testing (NHST) and the calculation of p-values. The class introduces the theoretical background of Bayesian statistics and its advantages over NHST. Based on this, students will work through hands-on approaches for analyzing various empirical data using Bayesian statistics. These analyses will mainly be conducted with the statistics software R and JASP. The class provides participants with the necessary skills to evaluate and interpret the results of published Bayesian analyses and to use the method for testing hypotheses and estimating model parameters based on empirical data. There will be regular reading and homework assignments.

**Requirements**

Participants should already have a basic knowledge of R and standard frequentist statistical tests. Please bring your own Laptop with you as we will be using R for several hands-on examples and exercises during the class. We will mainly work with the book "Statistical Rethinking. A Bayesian Course with Examples in R and Stan" by Richard McElrath. Students are advised to obtain the book before the class starts.

**Schedule**

The class will consist of three day-long sessions from 9:00 (s.t.) to 18:00. The first session will be held on Thursday, the 7th of May 2020. The second session will be on Thursday, the 28th of May. The third session will be on Thursday, the 18th of June. The classroom will be communicated to registered students in advance. In case classrooms will be closed due to the Corona virus, the class will be taught online and the schedule will be adapted.

**Grading**

Grades will be based on active participation (50%) and homework assignments (50%).

**Registration and number of participants**

Due to its interactive nature, participation will be limited to 10 students. If you want to participate, please send a short email to [scheibehenne@kit.edu](mailto:scheibehenne@kit.edu) until Thursday, the 23rd of April in which you outline why you are interested in this class and what your expectations are.

**Literature**

McElrath, R. (2016). Statistical Rethinking. A Bayesian Course with Examples in R and Stan. Taylor & Francis Group. (main literature)

Kruschke, J. (2014). Doing Bayesian Data Analysis: A Tutorial Introduction with R. Academic Press. (additional literature)

T

**6.153 Course: Introduction to Stochastic Optimization [T-WIWI-106546]**

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-102832 - Operations Research in Supply Chain Management](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2550470	<a href="#">Einführung in die Stochastische Optimierung</a>	2 SWS	Lecture (V)	Rebennack
SS 2020	2550471	<a href="#">Übung zur Einführung in die Stochastische Optimierung</a>	1 SWS	Practice (Ü)	Rebennack, Sinske
SS 2020	2550474	<a href="#">Rechnerübung zur Einführung in die Stochastische Optimierung</a>	SWS	Practice (Ü)	Rebennack, Sinske
Exams					
WS 19/20	7900242	<a href="#">Introduction to Stochastic Optimization</a>		Prüfung (PR)	Rebennack

**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

## 6.154 Course: Introduction to Video Analysis [T-INFO-101273]

**Responsible:** Prof. Dr.-Ing. Jürgen Beyerer  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100736 - Introduction to Video Analysis](#)  
[M-INFO-101239 - Machine Vision](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each summer term	1

Events					
SS 2020	24684	<a href="#">Introduction to Video Analysis</a>	2 SWS	Lecture (V)	Arens
Exams					
WS 19/20	7500099	<a href="#">Introduction to Video Analysis</a>		Prüfung (PR)	Beyerer, Arens
SS 2020	7500031	<a href="#">Introduction to Video Analysis</a>		Prüfung (PR)	Beyerer, Arens

T

## 6.155 Course: IT- Security Law [T-INFO-109910]

**Responsible:** PD Dr. Oliver Raabe  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101242 - Governance, Risk & Compliance](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	2400007	<a href="#">IT SECURITY LAW</a>	2 SWS	Lecture (V)	Raabe
Exams					
SS 2020	7500228	<a href="#">IT- Security Law</a>		Prüfung (PR)	Raabe



## T

## 6.156 Course: IT-Security Management for Networked Systems [T-INFO-101323]

**Responsible:** Prof. Dr. Hannes Hartenstein  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101204 - Networking Labs](#)  
[M-INFO-101207 - Networking Security - Theory and Praxis](#)  
[M-INFO-101210 - Dynamic IT-Infrastructures](#)  
[M-WIWI-101458 - Ubiquitous Computing](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each winter term	1

Events					
WS 19/20	24149	<a href="#">IT-Security Management for Networked Systems</a>	3 SWS	Lecture / Practice (VÜ)	Hartenstein, Grashöfer
Exams					
WS 19/20	7500599	<a href="#">IT-Security Management for Networked Systems</a>		Prüfung (PR)	Hartenstein

T

## 6.157 Course: Joint Entrepreneurship Summer School [T-WIWI-109064]

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)

Type	Credits	Recurrence	Version
Examination of another type	6	Irregular	1

Events					
SS 2020	2545021	<a href="#">Joint Entrepreneurship School</a>	SWS	Seminar (S)	Terzidis, Ntagiakou

### Competence Certificate

The learning control of the program (Summer School) consists of two parts:

#### A) Investor Pitch:

Based on a presentation (investor pitch) in front of a jury, the insights gained and developed during the course of the event are presented and the business idea presented. Among other things, the presentation performance of the team, the structured content and the logical consistency of the business idea are evaluated. The exact evaluation criteria will be announced in the course.

#### B) Written elaboration:

The second part of the assessment is a written report. The iterative knowledge gain of the entire event is systematically logged and can be further supplemented by the contents of the presentation. The report documents key action steps, applied methods, findings, market analyzes and interviews and prepares them in writing. The exact structure and requirements will be announced in the course.

The grade consists of 50% presentation performance and 50% written preparation.

### Prerequisites

The Summer School is aimed at master students of KIT. Prerequisite is the participation in the selection process.

### Recommendation

We recommend basic business knowledge, the lecture Entrepreneurship as well as openness and interest in intercultural exchange. Solid knowledge of the English language is an advantage.

### Annotation

The working language during the Summer School is English. A one-week stay in China is part of the Summer School.

## T

## 6.158 Course: Knowledge Discovery [T-WIWI-102666]

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101456 - Intelligent Systems and Services](#)  
[M-WIWI-105366 - Artificial Intelligence](#)  
[M-WIWI-105368 - Web and Data Science](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	2

Events					
WS 19/20	2511302	<a href="#">Knowledge Discovery</a>	2 SWS	Lecture (V)	Sure-Vetter, Färber
WS 19/20	2511303	<a href="#">Exercises to Knowledge Discovery</a>	1 SWS	Practice (Ü)	Sure-Vetter, Färber, Weller
Exams					
WS 19/20	7900013	<a href="#">Knowledge Discovery</a>		Prüfung (PR)	Sure-Vetter
SS 2020	7900039	<a href="#">Knowledge Discovery (Registration until 13 July 2020)</a>		Prüfung (PR)	Sure-Vetter

**Competence Certificate**

The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation.

Students can be awarded a bonus on their final grade if they successfully complete special assignments.

**Prerequisites**

None

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

## V

**Knowledge Discovery**

2511302, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

The lecture gives an overview of approaches of machine learning and data mining for knowledge acquisition from large data sets. These are examined especially with respect to algorithms, applicability to different data representations and the use in real application scenarios.

Knowledge Discovery is an established research area with a large community that investigates methods for discovering patterns and regularities in large amounts of data, including unstructured text. A variety of methods exist to extract patterns and provide previously unknown insights. This information can be predictive or descriptive.

The lecture gives an overview of Knowledge Discovery. Specific techniques and methods, challenges and current and future research topics in this research area will be taught.

Contents of the lecture cover the entire machine learning and data mining process with topics on supervised and unsupervised learning and empirical evaluation. Covered learning methods range from classical approaches like decision trees, support vector machines and neural networks to selected approaches from current research. Learning problems considered include feature vector-based learning and text mining.

**Learning objectives:**

Students

- know fundamentals of Machine Learning, Data Mining and Knowledge Discovery.
- are able to design, train and evaluate adaptive systems.
- conduct Knowledge Discovery projects in regards to algorithms, representations and applications.

**Workload:**

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

**Literature**

- T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning: Data Mining, Inference, and Prediction (<http://www-stat.stanford.edu/~tibs/ElemStatLearn/>)
- T. Mitchell. Machine Learning. 1997
- M. Berhold, D. Hand (eds). Intelligent Data Analysis - An Introduction. 2003
- P. Tan, M. Steinbach, V. Kumar: Introduction to Data Mining, 2005, Addison Wesley

**Exercises to Knowledge Discovery**

2511303, WS 19/20, 1 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

**Content**

The exercises are based on the lecture Knowledge Discovery. Several exercises are covered, which take up and discuss in detail the topics covered in the lecture Knowledge Discovery. Practical examples are demonstrated to the students to enable a knowledge transfer of the theoretical aspects learned into practical application.

Contents of the lecture cover the entire machine learning and data mining process with topics on monitored and unsupervised learning processes and empirical evaluation. The learning methods covered range from classical approaches like decision trees, support vector machines and neural networks to selected approaches from current research. Learning problems considered include feature vector-based learning and text mining.

**Learning objectives:**

Students

- know fundamentals of Machine Learning, Data Mining and Knowledge Discovery.
- are able to design, train and evaluate adaptive systems.
- conduct Knowledge Discovery projects in regards to algorithms, representations and applications.

**Literature**

- T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning: Data Mining, Inference, and Prediction (<http://www-stat.stanford.edu/~tibs/ElemStatLearn/>)
- T. Mitchell. Machine Learning. 1997
- M. Berhold, D. Hand (eds). Intelligent Data Analysis - An Introduction. 2003
- P. Tan, M. Steinbach, V. Kumar: Introduction to Data Mining, 2005, Addison Wesley

T

**6.159 Course: Lab Course: Natural Language Processing and Software Engineering [T-INFO-106239]****Responsible:** Prof. Dr. Walter Tichy**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-103138 - Lab Course: Natural Language Processing and Software Engineering](#)

Type	Credits	Recurrence	Version
Examination of another type	5	Each winter term	1

Events					
WS 19/20	2400082	<a href="#">Lab Course: Natural Language Processing and Software Engineering</a>	4 SWS	Practical course (P)	Weigelt, Hey
Exams					
WS 19/20	7500003	<a href="#">Natural Language Processing and Software Engineering</a>		Prüfung (PR)	Tichy

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

V

**Lab Course: Natural Language Processing and Software Engineering**2400082, WS 19/20, 4 SWS, Language: German, [Open in study portal](#)**Practical course (P)****Literature**

Verwendete Literatur wird im Praktikum bereitgestellt.

T

**6.160 Course: Lab: Graph Visualization in Practice [T-INFO-106580]**

**Responsible:** Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-103302 - Lab: Graph Visualization in Practice](#)

Type	Credits	Recurrence	Version
Examination of another type	5	Irregular	1

Events					
SS 2020	2400037	<a href="#">Graph Visualization in Practice</a>	2 SWS	Practical course (P)	Wagner, Mtsentlintze, Radermacher

## T

## 6.161 Course: Laboratory Course Algorithm Engineering [T-INFO-104374]

**Responsible:** Prof. Dr. Peter Sanders  
Prof. Dr. Dorothea Wagner

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101199 - Advanced Algorithms: Design and Analysis](#)  
[M-INFO-101200 - Advanced Algorithms: Engineering and Applications](#)  
[M-INFO-102072 - Laboratory Course Algorithm Engineering](#)

Type	Credits	Recurrence	Version
Examination of another type	6	Irregular	1

Events					
WS 19/20	24305	<a href="#">Practical Course in Algorithm Design</a>	4 SWS	Practical course (P)	Wagner, Buchhold, Zündorf, Zeitz, Sauer
Exams					
WS 19/20	7500072	<a href="#">Practical Course in Algorithm Design</a>		Prüfung (PR)	Wagner

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

## V

## Practical Course in Algorithm Design

24305, WS 19/20, 4 SWS, Language: German, [Open in study portal](#)

Practical course (P)

**Content**

In the practical course *Algorithm Engineering* the students are given miscellaneous questions from algorithmics, which they have to implement independently in small working groups. The main focus lies on object oriented programming with Java or C++. Linear programming may also occur.

**Prerequisites:** Knowledge of the lecture Algorithms II is recommended.

**Learning Goals:**

The purpose of the practical course in algorithm design is to make learned knowledge work. The students are given varying topics from algorithmics, which they have to implement in small working groups. Possible Topics are, for example, algorithms for flow problems, shortest path problems, or clustering techniques. In this way students learn to write efficient code.

**Workload:** Praktikum mit 4SWS, 6 LP  
6 LP entspricht ca. 180 Arbeitsstunden

T

**6.162 Course: Language Technology and Compiler [T-INFO-101343]**

**Responsible:** Prof. Dr.-Ing. Gregor Snelting  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100806 - Language Technology and Compiler](#)

Type	Credits	Recurrence	Version
Oral examination	8	Each summer term	1

Events					
SS 2020	24661	<a href="#">Language Technology and Compiler</a>	4 SWS	Lecture (V)	Snelting
Exams					
WS 19/20	7500107	<a href="#">Language Technology and Compiler</a>		Prüfung (PR)	Snelting
SS 2020	7500068	<a href="#">Language Technology and Compiler</a>		Prüfung (PR)	Snelting

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

V

**Language Technology and Compiler**

24661, SS 2020, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)



T

**6.163 Course: Large-scale Optimization [T-WIWI-106549]**

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)  
[M-WIWI-102832 - Operations Research in Supply Chain Management](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Exams				
WS 19/20	7900244	<a href="#">Large-scale Optimization</a>	Prüfung (PR)	Rebennack

**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

## 6.164 Course: Law of Contracts [T-INFO-101316]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101216 - Private Business Law](#)  
[M-INFO-101242 - Governance, Risk & Compliance](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
SS 2020	24671	<a href="#">Law of Contracts</a>	2 SWS	Lecture (V)	Hoff
Exams					
WS 19/20	7500059	<a href="#">Law of Contracts</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500055	<a href="#">Law of Contracts</a>		Prüfung (PR)	Dreier, Matz

T

**6.165 Course: Liberalised Power Markets [T-WIWI-107043]**

**Responsible:** Prof. Dr. Wolf Fichtner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101451 - Energy Economics and Energy Markets](#)  
[M-WIWI-102808 - Digital Service Systems in Industry](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2581998	<a href="#">Liberalised Power Markets</a>	2 SWS	Lecture (V)	Fichtner
Exams					
WS 19/20	7900193	<a href="#">Liberalised Power Markets</a>		Prüfung (PR)	Fichtner

**Competence Certificate**

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

**Prerequisites**

None

**Recommendation**

None

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

V

**Liberalised Power Markets**

2581998, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content****1. Power markets in the past, now and in future****2. Designing liberalised power markets**

- 2.1. Unbundling Dimensions of liberalised power markets
- 2.2. Central dispatch versus markets without central dispatch
- 2.3. The short-term market model
- 2.4. The long-term market model
- 2.5. Market flaws and market failure
- 2.6. Regulation in liberalised markets

**3. The power (sub)markets**

- 3.1 Day-ahead market
- 3.2 Intraday market
- 3.3 (Long-term) Forwards and futures markets
- 3.4 Emission rights market
- 3.5 Market for ancillary services
- 3.6 The “market” for renewable energies
- 3.7 Future market segments

**4. Grid operation and congestion management**

- 4.1. Grid operation
- 4.2. Congestion management

**5. Market power**

- 5.1. Defining market power
- 5.2. Indicators of market power
- 5.3. Reducing market power

**6. Future market structures in the electricity value chain****1. Power markets in the past, now and in future****2. Designing liberalised power markets**

- 2.2. Unbundling Dimensions of liberalised power markets
- 2.3. Central dispatch versus markets without central dispatch
- 2.4. The short-term market model
- 2.5. The long-term market model
- 2.6. Market flaws and market failure
- 2.7. Regulation in liberalised markets

**3. The power (sub)markets**

- 3.1 Day-ahead market
- 3.2 Intraday market
- 3.3 (Long-term) Forwards and futures markets
- 3.4 Emission rights market
- 3.5 Market for ancillary services
- 3.6 The “market” for renewable energies
- 3.7 Future market segments

**4. Grid operation and congestion management**

- 4.1. Grid operation
- 4.2. Congestion management

**5. Market power**

- 5.1. Defining market power
- 5.2. Indicators of market power
- 5.3. Reducing market power

**6. Future market structures in the electricity value chain**

**Literature**

**Weiterführende Literatur:**

Power System Economics; Steven Stoft, IEEE Press/Wiley-Interscience Press, 0-471-15040-1

T

**6.166 Course: Life Cycle Assessment [T-WIWI-110512]**

**Responsible:** Prof. Dr. Frank Schultmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101412 - Industrial Production III](#)  
[M-WIWI-101471 - Industrial Production II](#)

Type	Credits	Recurrence	Version
Written examination	3,5	Each winter term	1

Events					
WS 19/20	2581995	<a href="#">Life Cycle Assessment</a>	2 SWS	Lecture (V)	Schultmann, Maier
Exams					
WS 19/20	7981995	<a href="#">Life Cycle Assessment</a>		Prüfung (PR)	Schultmann

**Competence Certificate**

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

**Prerequisites**

None.

**Recommendation**

None

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

V

**Life Cycle Assessment**

2581995, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)****Content**

Introduction to life cycle assessment. The lecture describes structure and individual steps of life cycle assessment in detail.

**Literature**

werden in der Veranstaltung bekannt gegeben

T

**6.167 Course: Machine Learning - Basic Methods [T-INFO-110630]**

**Responsible:** Prof. Dr. Gerhard Neumann  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-105252 - Machine Learning - Basic Methods](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2400119	<a href="#">Maschinelles Lernen</a>	SWS	Lecture (V)	Neumann
Exams					
WS 19/20	7500260	<a href="#">Machine Learning - Basic Methods</a>		Prüfung (PR)	Neumann

## T

## 6.168 Course: Machine Learning 1 - Basic Methods [T-WIWI-106340]

**Responsible:** Prof. Dr.-Ing. Johann Marius Zöllner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103356 - Machine Learning](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	2

Events					
WS 19/20	2511500	<a href="#">Machine Learning 1 - Fundamental Methods</a>	2 SWS	Lecture (V)	Zöllner
WS 19/20	2511501	<a href="#">Exercises to Machine Learning 1 - Fundamental Methods</a>	1 SWS	Practice (Ü)	Zöllner
Exams					
WS 19/20	7900076	<a href="#">Machine Learning 1 - Basic Methods</a>		Prüfung (PR)	Zöllner
SS 2020	7900154	<a href="#">Machine Learning 1 - Basic Methods (Registration until 13 July 2020)</a>		Prüfung (PR)	Zöllner

**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 (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**

The course T-INFO-101354 "Machine Learning 1 - Basic Methods" must not be chosen.

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

## V

**Machine Learning 1 - Fundamental Methods**

2511500, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The field of knowledge acquisition and machine learning is a rapidly expanding field of knowledge and the subject of numerous research and development projects. The acquisition of knowledge can take place in different ways. Thus a system can benefit from experiences already made, it can be trained, or it draws conclusions from extensive background knowledge.

The lecture covers symbolic learning methods such as inductive learning (learning from examples, learning by observation), deductive learning (explanation-based learning) and learning from analogies, as well as sub-symbolic techniques such as neural networks, support vector machines and genetic algorithms. The lecture introduces the basic principles and structures of learning systems and examines the algorithms developed so far. The structure and operation of learning systems is presented and explained with some examples, especially from the fields of robotics and image processing.

**Learning objectives:**

- Students acquire knowledge of the fundamental methods in the field of machine learning.
- Students can classify, formally describe and evaluate methods of machine learning.
- Students can use their knowledge to select suitable models and methods for selected problems in the field of machine learning.



**Literature**

Die Foliensätze sind als PDF verfügbar

**Weiterführende Literatur**

- Artificial Intelligence: A Modern Approach - Peter Norvig and Stuart J. Russell
- Machine Learning - Tom Mitchell
- Pattern Recognition and Machine Learning - Christopher M. Bishop
- Reinforcement Learning: An Introduction - Richard S. Sutton and Andrew G. Barto
- Deep Learning - Ian Goodfellow, Yoshua Bengio, Aaron Courville

**Weitere (spezifische) Literatur zu einzelnen Themen wird in der Vorlesung angegeben.**

T

## 6.169 Course: Machine Learning 2 – Advanced Methods [T-WIWI-106341]

**Responsible:** Prof. Dr.-Ing. Johann Marius Zöllner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101637 - Analytics and Statistics](#)  
[M-WIWI-103356 - Machine Learning](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Events					
SS 2020	2511502	<a href="#">Machine Learning 2 - Advanced methods</a>	2 SWS	Lecture (V)	Zöllner
SS 2020	2511503	<a href="#">Exercises for Machine Learning 2 - Advanced Methods</a>	1 SWS	Practice (Ü)	Zöllner
Exams					
WS 19/20	7900050	<a href="#">Machine Learning 2 – Advanced Methods</a>		Prüfung (PR)	Zöllner
SS 2020	7900080	<a href="#">Machine Learning 2 – Advanced Methods (Registration until 13 July 2020)</a>		Prüfung (PR)	Zöllner

### 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 (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

The course T-INFO-101392 “Machine Learning 2 – Advanced Methods” must not be chosen.

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

V

### Machine Learning 2 - Advanced methods

2511502, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

The subject area of machine intelligence and, in particular, machine learning, taking into account real challenges of complex application domains, is a rapidly expanding field of knowledge and the subject of numerous research and development projects.

The lecture "Machine Learning 2" deals with advanced methods of machine learning such as semi-supervised and active learning, deep neural networks (deep learning), pulsed networks, hierarchical approaches, e.g. As well as dynamic, probabilistic relational methods. Another focus is the embedding and application of machine learning methods in real systems.

The lecture introduces the latest basic principles as well as extended basic structures and elucidates previously developed algorithms. The structure and the mode of operation of the methods and methods are presented and explained by means of some application scenarios, especially in the field of technical (sub) autonomous systems (robotics, neurorobotics, image processing, etc.).

### Learning objectives:

- Students understand extended concepts of machine learning and their possible applications.
- Students can classify, formally describe and evaluate methods of machine learning.
- In detail, methods of machine learning can be embedded and applied in complex decision and inference systems.
- Students can use their knowledge to select suitable models and methods of machine learning for existing problems in the field of machine intelligence.

### Recommendations:

Attending the lecture **Machine Learning 1** or a comparable lecture is very helpful in understanding this lecture.

**Literature**

Die Foliensätze sind als PDF verfügbar

**Weiterführende Literatur**

- Artificial Intelligence: A Modern Approach - Peter Norvig and Stuart J. Russell
- Machine Learning - Tom Mitchell
- Pattern Recognition and Machine Learning - Christopher M. Bishop
- Reinforcement Learning: An Introduction - Richard S. Sutton and Andrew G. Barto
- Deep Learning - Ian Goodfellow, Yoshua Bengio, Aaron Courville

**Weitere (spezifische) Literatur zu einzelnen Themen wird in der Vorlesung angegeben.**

T

## 6.170 Course: Management Accounting 1 [T-WIWI-102800]

**Responsible:** Prof. Dr. Marcus Wouters  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101498 - Management Accounting](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Events					
SS 2020	2579900	<a href="#">Management Accounting 1</a>	2 SWS	Lecture (V)	Wouters
SS 2020	2579901	<a href="#">Übung zu Management Accounting 1 (Bachelor)</a>	2 SWS	Practice (Ü)	Riar
SS 2020	2579902		2 SWS	Practice (Ü)	Riar
Exams					
WS 19/20	79-2579900-B	<a href="#">Management Accounting 1 (Bachelor)</a>		Prüfung (PR)	Wouters
WS 19/20	79-2579900-M	<a href="#">Management Accounting 1 (Mastervorzug und Master)</a>		Prüfung (PR)	Wouters

**Competence Certificate**

The assessment consists of a written exam (120 minutes) (following §4(2), 1 of the examination regulation) at the end of each semester.

**Prerequisites**

None

**Annotation**

Students in the Bachelor' program can only take the related tutorial and examination. Students in the Master's program (and Bachelor's students who are already completing examinations for their Master's program) can only take the related tutorial and examination.

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

V

**Management Accounting 1**

2579900, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA1 are: short-term planning, investment decisions, budgeting and activity-based costing.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

**Learning objectives:**

- Students have an understanding of theory and applications of management accounting topics.
- They can use financial information for various purposes in organizations.

**Examination:**

- The assessment consists of a written exam (120 minutes) at the end of each semester (following § 4 (2) No. 1 of the examination regulation).

**Workload:**

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

**Literature**

- Marc Wouters, Frank H. Selto, Ronald W. Hilton, Michael W. Maher: Cost Management – Strategies for Business Decisions, 2012, Publisher: McGraw-Hill Higher Education (ISBN-13 9780077132392 / ISBN-10 0077132394)
- In addition, several papers that will be available on ILIAS.

**Übung zu Management Accounting 1 (Bachelor)**

2579901, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

**Content**

see Module Handbook



2579902, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

**Content**

see Module Handbook

T

## 6.171 Course: Management Accounting 2 [T-WIWI-102801]

**Responsible:** Prof. Dr. Marcus Wouters  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101498 - Management Accounting](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	2

Events					
WS 19/20	2579903	<a href="#">Management Accounting 2</a>	2 SWS	Lecture (V)	Wouters
WS 19/20	2579904		2 SWS	Practice (Ü)	Ebinger
WS 19/20	2579905		2 SWS	Practice (Ü)	Ebinger
Exams					
WS 19/20	79-2579903-B	<a href="#">Management Accounting 2 (Bachelor)</a>		Prüfung (PR)	Wouters
WS 19/20	79-2579903-M	<a href="#">Management Accounting 2 (Mastervorzug und Master)</a>		Prüfung (PR)	Wouters

**Competence Certificate**

The assessment consists of a written exam (120 minutes) at the end of each semester.

**Prerequisites**

None

**Recommendation**

It is recommended to take part in the course "Management Accounting 1" before this course.

**Annotation**

Students in the Bachelor' program can only take the related tutorial and examination. Students in the Master's program (and Bachelor's students who are already completing examinations for their Master's program) can only take the related tutorial and examination.

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

V

**Management Accounting 2**

2579903, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA2 are: cost estimation, product costing and cost allocation, financial performance measures, transfer pricing, strategic performance measurement systems.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

**Learning objectives:**

- Students have an understanding of theory and applications of management accounting topics. They can use financial information for various purposes in organizations.

**Recommendations:**

- It is recommended to take part in the course "Management Accounting 1" before this course.

**Examination:**

- The assessment consists of a written exam (120 min) at the end of each semester (following § 4 (2) No. 1 of the examination regulation).

**Workload:**

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

**Literature**

- Marc Wouters, Frank H. Selto, Ronald W. Hilton, Michael W. Maher: Cost Management – Strategies for Business Decisions, 2012, Verlag: McGraw-Hill Higher Education (ISBN-13 9780077132392 / ISBN-10 0077132394)
- Zusätzlich werden Artikel auf ILIAS zur Vergütung gestellt.



2579904, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Practice (Ü)**

**Content**

see ILIAS



2579905, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Practice (Ü)**

**Content**

see ILIAS

T

**6.172 Course: Management of IT-Projects [T-WIWI-102667]**

**Responsible:** Dr. Roland Schätzle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101477 - Development of Business Information Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	3

Events					
SS 2020	2511214	<a href="#">Management of IT-Projects</a>	2 SWS	Lecture (V)	Schätzle
SS 2020	2511215	<a href="#">Übungen zu Management von Informatik-Projekten</a>	1 SWS	Practice (Ü)	Schätzle
Exams					
WS 19/20	7900014	<a href="#">Management of IT-Projects</a>		Prüfung (PR)	Oberweis
SS 2020	7900045	<a href="#">Management of IT-Projects (Registration until 13 July 2020)</a>		Prüfung (PR)	Oberweis

**Competence Certificate**

The assessment takes place in the form of a written examination (exam) in the amount of 60 minutes. The examination is offered every semester and can be repeated at any regular examination date.

Prerequisite for the participation in the examination is the successful participation in the exercise, which takes place in the summer semester, starting from summer semester 2020. The number of participants in the exercise is limited.

The exact details will be announced in the lecture.

**Prerequisites**

Prerequisite for the participation in the examination is the successful participation in the exercise, which takes place in the summer semester, starting from summer semester 2020. The number of participants in the exercise is limited.

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

V

**Management of IT-Projects**

2511214, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)



**Content**

The lecture deals with the general framework, impact factors and methods for planning, handling, and controlling of IT projects. Especially following topics are addressed:

- project environment
- project organisation
- project planning including the following items:
  - plan of the project structure
  - flow chart
  - project schedule
  - plan of resources
- effort estimation
- project infrastructure
- project controlling
- risk management
- feasibility studies
- decision processes, conduct of negotiations, time management.

**Learning objectives:**

Students

- explain the terminology of IT project management and typical used methods for planning, handling and controlling,
- apply methods appropriate to current project phases and project contexts,
- consider organisational and social impact factors.

**Recommendations:**

Knowledge from the lecture Software Engineering is helpful.

**Workload:**

- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h

**Literature**

- B. Hindel, K. Hörmann, M. Müller, J. Schmied. Basiswissen Software-Projektmanagement. dpunkt.verlag 2004
- Project Management Institute Standards Committee. A Guide to the Project Management Body of Knowledge (PMBOK guide). Project Management Institute. Four Campus Boulevard. Newton Square. PA 190733299. U.S.A.

**Übungen zu Management von Informatik-Projekten**

2511215, SS 2020, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)

**Content**

The general conditions, influencing factors and methods in the planning, execution and control of IT projects are dealt with. In particular, the following topics will be dealt with: Project environment, project organization, project structure plan, effort estimation, project infrastructure, project control, decision-making processes, negotiation, time management. The lecture is accompanied by exercises in the form of tutorials. The date of the exercise will be announced later.

T

**6.173 Course: Managing New Technologies [T-WIWI-102612]**

**Responsible:** Dr. Thomas Reiß  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	2

Events					
SS 2020	2545003	<a href="#">Managing New Technologies</a>	2 SWS	Lecture (V)	Reiß
Exams					
WS 19/20	7900189	<a href="#">Managing New Technologies</a>		Prüfung (PR)	Reiß

**Competence Certificate**

Written exam 100% following §4, Abs. 2.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

The credit points for T-WIWI-102612 "Management of New Technologies" were reduced to 3 credit points in the 2019 summer semester.

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

V

**Managing New Technologies**

2545003, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

- Hausschildt/Salomo: Innovationsmanagement; Borchert et al.: Innovations- und Technologiemanagement;
- Specht/Möhrle; Gabler Lexikon Technologiemanagement

Die relevanten Auszüge und zusätzlichen Quellen werden in der Veranstaltung bekannt gegeben.

## T

## 6.174 Course: Market Engineering: Information in Institutions [T-WIWI-102640]

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101409 - Electronic Markets](#)  
[M-WIWI-101446 - Market Engineering](#)  
[M-WIWI-101453 - Applied Strategic Decisions](#)  
[M-WIWI-102754 - Service Economics and Management](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2540460	<a href="#">Market Engineering: Information in Institutions</a>	2 SWS	Lecture (V)	Straub
SS 2020	2540461	<a href="#">Übungen zu Market Engineering: Information in Institutions</a>	1 SWS	Practice (Ü)	Golla
Exams					
WS 19/20	7900208	<a href="#">Market Engineering: Information in Institutions (Nachklausur aus SS19)</a>		Prüfung (PR)	Weinhardt

**Competence Certificate**

The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) up to 6 bonus points can be obtained. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by max. one grade level (0.3 or 0.4).

**Prerequisites**

None

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

## V

**Market Engineering: Information in Institutions**

2540460, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

- Roth, A., 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., Topics in Microeconomics - Industrial Organization, Auctions, and Incentives. Cambridge, Cambridge University Press, 1999.
- Smith, V. "Theory, Experiments and Economics", *The Journal of Economic Perspectives*, Vol. 3, No. 1, 151-69 1989

T

**6.175 Course: Market Research [T-WIWI-107720]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101510 - Cross-Functional Management Accounting](#)  
[M-WIWI-101647 - Data Science: Evidence-based Marketing](#)  
[M-WIWI-105312 - Marketing and Sales Management](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2571150	<a href="#">Market Research</a>	2 SWS	Lecture (V)	Klarmann
SS 2020	2571151	<a href="#">Market Research Tutorial</a>	1 SWS	Practice (Ü)	Honold
Exams					
WS 19/20	7900217	<a href="#">Market Research</a>		Prüfung (PR)	Klarmann

**Competence Certificate**

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

**Prerequisites**

None

**Recommendation**

None

**Annotation**

Please note that this course has to be completed successfully by students interested in master thesis positions at the Marketing & Sales Research Group.

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

V

**Market Research**

2571150, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

Within the lecture, essential statistical methods for measuring customer attitudes (e.g. satisfaction measurement), understanding customer behavior and making strategic decisions will be discussed. The practical use as well as the correct handling of different survey methods will be taught, such as experiments and surveys. To analyze the collected data, various analysis methods are presented, including hypothesis tests, factor analyses, cluster analyses, variance and regression analyses. Building on this, the interpretation of the results will be discussed.

Topics addressed in this course are for example:

- Theoretical foundations of market research
- Statistical foundations of market research
- Measuring customer attitudes
- Understanding customer reactions
- Strategical decision making

The aim of this lecture is to give an overview of essential statistical methods. In the lecture students learn the practical use as well as the correct handling of different statistical survey methods and analysis procedures. In addition, emphasis is put on the interpretation of the results after the application of an empirical survey. The derivation of strategic options is an important competence that is required in many companies in order to react optimally to customer needs.

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

The total workload for this course is approximately 135.0 hours.

Presence time: 30 hours

Preparation and wrap-up of the course: 45.0 hours

Exam and exam preparation: 60.0 hours

Please note that this course has to be completed successfully by students interested in seminar or master thesis positions at the chair of marketing.

**Literature**

Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.

**6.176 Course: Marketing Analytics [T-WIWI-103139]****Responsible:** Prof. Dr. Martin Klarmann**Organisation:** KIT Department of Economics and Management**Part of:** [M-WIWI-101647 - Data Science: Evidence-based Marketing](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	4

Events					
WS 19/20	2572170	<a href="#">Marketing Analytics</a>	2 SWS	Lecture (V)	Klarmann
WS 19/20	2572171		1 SWS	Practice (Ü)	Halbauer
Exams					
WS 19/20	7900082	<a href="#">Marketing Analytics</a>		Prüfung (PR)	Klarmann
WS 19/20	7900127	<a href="#">Marketing Analytics</a>		Prüfung (PR)	Klarmann

**Competence Certificate**

The assessment consists of a written exam (60 min) (according to Section 4(2), 1 of the examination regulation)

**Prerequisites**

The prerequisite for taking the course is the successful completion of the course Market Research [2571150].

**Recommendation**

It is strongly recommended to complete the course Market Research prior to taking the Marketing Analytics course.

**Annotation**

For further information please contact the Marketing and Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

Exchange students can bypass the requirement of passing Market Research if they can prove that they possess sufficient statistical knowledge based on courses attended at their home institution. This will be examined individually by the Marketing & Sales Research Group.

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

**Marketing Analytics**2572170, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)**Lecture (V)****Content**

In this course various relevant market research questions are addressed, as for example measuring and understanding customer attitudes, preparing strategic decisions and sales forecasting. In order to analyze these questions, students learn to handle social media data, panel data, nested observations and experimental design. To analyze the data, advanced methods, as for example multilevel modeling, structural equation modeling and return on marketing models are taught. Also, problems of causality are addressed in-depth. The lecture is accompanied by a computer-based exercise, in the course of which the methods are applied practically.

Students

- receive based on the course market research an overview of advanced empirical methods
- learn in the course of the lecture to handle advanced data collection and data analysis methods
- are based on the acquired knowledge able to interpret results and derive strategic implications

Total workload for 4.5 ECTS: ca. 135 hours.

In order to attend Marketing Analytics, students are required to have passed the course Market Research.

Exchange students can bypass the requirement of passing Market Research if they can prove that they possess sufficient statistical knowledge based on courses attended at their home institution. This will be examined individually by the Marketing & Sales Research Group.

For further information please contact the Marketing and Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

**Literature**

- Hanssens, Dominique M., Parsons, Leonard J., Schultz, Randall L. (2003), Market response models: Econometric and time series analysis, 2nd ed, Boston.
- Gelman, Andrew, Hill, Jennifer (2006), Data analysis using regression and multilevel/hierarchical models, New York.
- Cameron, A. Colin, Trivedi, Pravin K. (2005), Microeconometrics: methods and applications, New York.
- Chapman, Christopher, Feit, Elea M. (2015), R for Marketing Research and Analytics, Cham.
- Ledolter, Johannes (2013), Data mining and business analytics with R, New York.

T

**6.177 Course: Marketing Strategy Business Game [T-WIWI-102835]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101510 - Cross-Functional Management Accounting](#)  
[M-WIWI-105312 - Marketing and Sales Management](#)

Type	Credits	Recurrence	Version
Examination of another type	1,5	Each summer term	1

Events					
SS 2020	2571183	<a href="#">Marketing Strategy Business Game</a>	1 SWS	Block (B)	Klarmann, Mitarbeiter

**Competence Certificate**

The assessment (alternative exam assessment) consists of a group presentation and a subsequent round of questions totalling 20 minutes.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

Please note that only one of the courses from the election block can be chosen in the module.

Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1.5 ECTS points in the respective module to all students. Participation in a specific course cannot be guaranteed.

In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in summer term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)) shortly before the lecture period in summer term starts.

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

V

**Marketing Strategy Business Game**

2571183, SS 2020, 1 SWS, Language: German, [Open in study portal](#)

**Block (B)**



**Content**

Using Markstrat, a marketing strategy business game, students work in groups representing a company that competes on a simulated market against the other groups' companies.

**Students**

- are able to operate the strategic marketing simulation software "Markstrat"
- are able to take strategic marketing decisions in groups
- know how to apply strategic marketing concepts to practical contexts (e.g. for market segmentation, product launches, coordination of the marketing mix, market research, choice of the distribution channel or competitive behavior)
- are capable to collect and to select information usefully with the aim of decision-making
- are able to react appropriately to predetermined market conditions
- know how to present their strategies in a clear and consistent way
- are able to talk about the success, problems, critical incidents, external influences and strategy changes during the experimental game and to reflect and present their learning success

Non exam assessment (following §4(2), 3 of the examination regulation).

The total workload for this course is approximately 45.0 hours. For further information see German version.

- Please note that only one of the courses from the election block can be chosen in the module.
- Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1.5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.
- In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in summer term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)) shortly before the lecture period in summer term starts.

**Literature**

Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.

T

**6.178 Course: Master Thesis [T-WIWI-103142]**

**Responsible:** Studiendekan der KIT-Fakultät für Informatik  
Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften

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

**Part of:** [M-WIWI-101656 - Module Master Thesis](#)

Type	Credits	Version
Final Thesis	30	1

**Competence Certificate**

see module description

**Prerequisites**

see module description

**Final Thesis**

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

<b>Submission deadline</b>	6 months
<b>Maximum extension period</b>	3 months
<b>Correction period</b>	8 weeks

T

## 6.179 Course: Mechanisms and Applications of Workflow Systems [T-INFO-101257]

**Responsible:** Jutta Mülle**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101208 - Innovative Concepts of Data and Information Management](#)

Type	Credits	Recurrence	Version
Written examination	5	Each winter term	1

Events					
WS 19/20	24111	<a href="#">Konzepte und Anwendungen von Workflowsystemen</a>	3 SWS	Lecture (V)	Mülle
Exams					
WS 19/20	7500089	<a href="#">Mechanisms and Applications of Workflow Systems</a>		Prüfung (PR)	Böhm, Mülle

T

**6.180 Course: Meshes and Point Clouds [T-INFO-101349]**

**Responsible:** Prof. Dr. Hartmut Prautzsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100812 - Meshes and Point Clouds](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each term	1

**6.181 Course: Methods in Economic Dynamics [T-WIWI-102906]**

**Responsible:** Prof. Dr. Ingrid Ott  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101514 - Innovation Economics](#)

Type	Credits	Recurrence	Version
Examination of another type	1,5	Each summer term	2

Events					
SS 2020	2560240	<a href="#">Methods in Economic Dynamics</a>	SWS	Lecture (V)	Ott, Bälz

**Competence Certificate**

Alternative exam assessment.

**Prerequisites**

None

**Recommendation**

Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012] and Economics II [2600014]. Further, it is assumed that students have interest in using quantitative-mathematical methods.

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

**Methods in Economic Dynamics**

2560240, SS 2020, SWS, Language: German/English, [Open in study portal](#)

Lecture (V)

**Content**

The economic exploitation of inventions is an important part of innovation economics. Intellectual property rights such as patents or trademarks play a central role. Within this workshop, the recording, processing and analysis of such intellectual property rights will be deepened, e.g. considering specific technologies. Students will learn how to work with relational databases, the econometric evaluation of recorded data, and methods for visualising them.

**Learning objectives:**

The student

- learns to query data sources.
- is able to analyse data with statistical methods.
- visualises and interprets data evaluations (e.g. using dashboards or methods of network analysis).

**Recommendations:**

An interest in working with data, basic knowledge on databases as well as basic knowledge in economics and statistics are advantageous.

**Workload:**

The total workload for this course is approximately 45 hours.

- Classes: ca. 5 h
- Self-study: ca. 40 h

**Assessment:**

Non exam assessment according to § 4 paragraph 3 of the examination regulation (SPO 2015).

**Literature**

Relevante Literatur wird in der Vorlesung bekanntgegeben.  
 (Relevant literature will be announced in the lecture.)

## T

## 6.182 Course: Methods in Innovation Management [T-WIWI-110263]

**Responsible:** Dr. Daniel Jeffrey Koch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101507 - Innovation Management](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each winter term	1

Events					
WS 19/20	2545107	<a href="#">Methoden im Innovationsmanagement</a>	2 SWS	Seminar (S)	Koch
Exams					
WS 19/20	7900143	<a href="#">Methods in Innovation Management</a>		Prüfung (PR)	Weissenberger-Eibl

**Competence Certificate**

Alternative exam assessments (§4(2), 3 SPO). The final grade is composed 75% of the grade of the written paper and 25% of the grade of the presentation.

**Prerequisites**

None.

**Recommendation**

Prior attendance of the course "Innovation Management: Concepts, Strategies and Methods" is recommended.

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

## V

**Methoden im Innovationsmanagement**

2545107, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

The seminar "Methods in Innovation Management" aims at the discussion and development of different methods for the structured generation of ideas in selected contexts. In a block seminar, methods and contexts are discussed, from which seminar topics are defined with the participants. These topics are to be worked on independently using methods and procedures. The results will be presented at a presentation date and then a written seminar paper will be prepared. This means that creativity methods and their combination will be presented and applied. The methods are worked on in a structured form and process-like sequence in order to clarify the advantages and disadvantages of different methods.

**Literature**

Werden in der ersten Veranstaltung bekannt gegeben.

T

## 6.183 Course: Mixed Integer Programming I [T-WIWI-102719]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)  
[M-WIWI-102832 - Operations Research in Supply Chain Management](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Events					
WS 19/20	2550138	<a href="#">Mixed-integer Programming I</a>	2 SWS	Lecture (V)	Stein
WS 19/20	2550139	<a href="#">Exercises Mixed Integer Programming I</a>	SWS	Practice (Ü)	Stein
Exams					
WS 19/20	7900008_WS1920_HK	<a href="#">Mixed Integer Programming I</a>		Prüfung (PR)	Stein

### Competence Certificate

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation.

The examination is held in the semester of the lecture and in the following semester.

Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

The examination can also be combined with the examination of *Mixed Integer Programming II* [25140]. In this case, the duration of the written examination takes 120 minutes.

### Prerequisites

None

### Recommendation

It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

### Annotation

The lecture is offered irregularly. The curriculum of the next three years is available online ([kop.ior.kit.edu](http://kop.ior.kit.edu)).

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

V

### Mixed-integer Programming I

2550138, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

Many optimization problems from economics, engineering and natural sciences are modeled with continuous as well as with discrete variables. Examples are the energy minimal design of a chemical process in which several reactors may be switched on or off, portfolio optimization with limitations on the number of securities, the choice of locations to serve customers at minimum cost, and the optimal design of vote allocations in election procedures. For the algorithmic identification of optimal points of such problems an interaction of ideas from discrete as well as continuous optimization is necessary.

The lecture focusses on mixed-integer *linear* optimization problems and is structured as follows:

- Introduction, solvability, and basic concepts
- LP relaxation and error bounds for roundings
- Branch-and-bound method
- Gomory's cutting plane method
- Benders decomposition

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 mixed-integer *nonlinear* optimization problems forms the contents of the lecture "Mixed-integer Programming II".

**Learning objectives:**

The student

- knows and understands the fundamentals of linear mixed integer programming,
- is able to choose, design and apply modern techniques of linear mixed integer programming in practice.

**Literature**

- C.A. Floudas, Nonlinear and Mixed-Integer Optimization: Fundamentals and Applications, Oxford University Press, 1995
- J. Kallrath: Gemischt-ganzzahlige Optimierung, Vieweg, 2002
- D. Li, X. Sun: Nonlinear Integer Programming, Springer, 2006
- G.L. Nemhauser, L.A. Wolsey, Integer and Combinatorial Optimization, Wiley, 1988
- M. Tawarmalani, N.V. Sahinidis, Convexification and Global Optimization in Continuous and Mixed-Integer Nonlinear Programming, Kluwer, 2002.



T

**6.184 Course: Mixed Integer Programming II [T-WIWI-102720]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)  
[M-WIWI-102832 - Operations Research in Supply Chain Management](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

**Competence Certificate**

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation.

The examination is held in the semester of the lecture and in the following semester.

Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

The examination can also be combined with the examination of *Mixed Integer Programming I* [2550138]. In this case, the duration of the written examination takes 120 minutes.

**Prerequisites**

None

**Recommendation**

It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

**Annotation**

The lecture is offered irregularly. The curriculum of the next three years is available online ([kop.iior.kit.edu](http://kop.iior.kit.edu)).

T

**6.185 Course: Mobile Communication [T-INFO-101322]**

**Responsible:** Prof. Dr. Oliver Waldhorst  
Prof. Dr. Martina Zitterbart

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-100785 - Mobile Communication](#)  
[M-INFO-101203 - Wireless Networking](#)  
[M-INFO-101205 - Future Networking](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each winter term	1

Events					
WS 19/20	24643	<a href="#">Mobile Communications</a>	2 SWS	Lecture (V)	Waldhorst, Jung
Exams					
WS 19/20	7500015	<a href="#">Mobile Communication</a>		Prüfung (PR)	Waldhorst, Zitterbart

T

## 6.186 Course: Model Driven Software Development [T-INFO-101278]

**Responsible:** Prof. Dr. Ralf Reussner  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101201 - Software Systems](#)  
[M-INFO-101202 - Software Methods](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each winter term	1

Events					
WS 19/20	24657	<a href="#">Model-Driven Software Engineering</a>	2 SWS	Lecture (V)	Burger
Exams					
WS 19/20	7500086	<a href="#">Model Driven Software Development</a>		Prüfung (PR)	Reussner

T

## 6.187 Course: Modeling and Analyzing Consumer Behavior with R [T-WIWI-102899]

**Responsible:** Dr. Verena Dorner  
Prof. Dr. Christof Weinhardt

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

**Part of:** [M-WIWI-101448 - Service Management](#)  
[M-WIWI-101506 - Service Analytics](#)  
[M-WIWI-103118 - Data Science: Data-Driven User Modeling](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2540470	<a href="#">Modeling and Analyzing Consumer Behavior with R</a>	2 SWS	Lecture (V)	Dorner, Greif-Winzrieth, Knierim
SS 2020	2540471	<a href="#">Übung zu Modeling and Analyzing Consumer Behaviour with R</a>	1 SWS	Practice (Ü)	Knierim, Greif-Winzrieth, Dorner
Exams					
WS 19/20	7900262	<a href="#">Modeling and Analyzing Consumer Behavior with R (Nachklausur aus dem SS19)</a>		Prüfung (PR)	Weinhardt

### Competence Certificate

The assessment consists of a written exam (60 min) (according to §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

None

### Recommendation

None

### Annotation

Number of participants limited.

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

V

### Modeling and Analyzing Consumer Behavior with R

2540470, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Literature

Field, A., Miles, J., Field, Z., *Discovering Statistics Using R*, SAGE 2014

Jones, O., Maillardet, R., Robinson, A., *Scientific Programming and Simulation Using R*, Chapman & Hall / CRC Press 2009

Venables, W.N., Smith, D.M. and the R Core Team, "An Introduction to R", 2012 (Version 2.15.2), <http://cran.r-project.org/doc/manuals/R-intro.pdf>

Wickham, Hadley, *ggplot2: Elegant Graphics for Data Analysis (Use R!)*, Springer 2009 (2nd edition)

T

## 6.188 Course: Modeling and OR-Software: Advanced Topics [T-WIWI-106200]

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-102808 - Digital Service Systems in Industry](#)  
[M-WIWI-102832 - Operations Research in Supply Chain Management](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each winter term	2

Events					
WS 19/20	2550490	<a href="#">Modellieren und OR-Software: Fortgeschrittene Themen</a>	3 SWS	Practical course (P)	Pomes, Zander, Bakker
Exams					
WS 19/20	00019	<a href="#">Modeling and OR-Software: Advanced Topics</a>	Prüfung (PR)		Nickel

### 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

Basic knowledge as conveyed in the module *Introduction to Operations Research* is assumed.

Successful completion of the course *Modeling and OR-Software: Introduction*.

### Annotation

Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.

The lecture is held 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: Fortgeschrittene Themen

2550490, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Practical course (P)

### Content

The advanced course is designated for Master students that already attended the introductory course or gained equivalent experience elsewhere, e.g. during a seminar or bachelor thesis. We will work on advanced topics and methods in OR, among others cutting planes, column generation and constraint programming. The Software used for the exercises is IBM ILOG CPLEX Optimization Studio. The associated modelling programming languages are OPL and ILOG Script.

T

**6.189 Course: Models of Parallel Processing [T-INFO-101365]**

**Responsible:** Thomas Worsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100828 - Models of Parallel Processing](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each summer term	1

Events					
SS 2020	24606	<a href="#">Modelle der Parallelverarbeitung</a>	3 SWS	Lecture (V)	Worsch, Vollmar
Exams					
WS 19/20	75400003	<a href="#">Models of Parallel Processing</a>		Prüfung (PR)	Worsch

T

**6.190 Course: Multivariate Statistical Methods [T-WIWI-103124]**

**Responsible:** Prof. Dr. Oliver Grothe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)  
[M-WIWI-101637 - Analytics and Statistics](#)  
[M-WIWI-101639 - Econometrics and Statistics II](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2550554	<a href="#">Multivariate Verfahren</a>	2 SWS	Lecture (V)	Grothe
SS 2020	2550555	<a href="#">Übung zu Multivariate Verfahren</a>	2 SWS	Practice (Ü)	Grothe, Kächele

**Competence Certificate**

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. A bonus program can improve the grade by one grade level (i.e. by 0.3 or 0.4).

The exam is offered every semester. Re-examinations are offered only for repeaters.

**Prerequisites**

None

**Recommendation**

The course covers highly advanced statistical methods with a quantitative focus. Hence, participants are necessarily expected to have advanced statistical knowledge, e.g. acquired in the course "Advanced Statistics". Without this, participation in the course is not advised.

Previous attendance of the course Analysis of Multivariate Data is recommended. Alternatively, the script can be provided to interested students.

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

V

**Multivariate Verfahren**

2550554, SS 2020, 2 SWS, [Open in study portal](#)

Lecture (V)

**Literature**

Skript zur Vorlesung

## T

## 6.191 Course: Network Security: Architectures and Protocols [T-INFO-101319]

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100782 - Network Security: Architectures and Protocols](#)  
[M-INFO-101203 - Wireless Networking](#)  
[M-INFO-101204 - Networking Labs](#)  
[M-INFO-101206 - Networking](#)  
[M-INFO-101207 - Networking Security - Theory and Praxis](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2020	24601	<a href="#">Netsicherheit: Architekturen und Protokolle</a>	2 SWS	Lecture (V)	Baumgart, Bless, Heseding, Zitterbart
Exams					
WS 19/20	7500014	<a href="#">Network Security: Architectures and Protocols</a>		Prüfung (PR)	Zitterbart
WS 19/20	7500277	<a href="#">Network Security: Architectures and Protocols für Wiederholer</a>		Prüfung (PR)	Zitterbart



T

**6.192 Course: Next Generation Internet [T-INFO-101321]**

**Responsible:** Dr.-Ing. Roland Bless  
Prof. Dr. Martina Zitterbart

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101205 - Future Networking](#)  
[M-INFO-101206 - Networking](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2020	24674	<a href="#">Next Generation Internet</a>	2 SWS	Lecture (V)	Bless
Exams					
WS 19/20	7500016	<a href="#">Next Generation Internet</a>		Prüfung (PR)	Bless, Zitterbart
WS 19/20	7500236	<a href="#">Next Generation Internet für Wiederholer</a>		Prüfung (PR)	Bless, Zitterbart

T

## 6.193 Course: Non- and Semiparametrics [T-WIWI-103126]

**Responsible:** Prof. Dr. Melanie Schienle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101638 - Econometrics and Statistics I](#)  
[M-WIWI-101639 - Econometrics and Statistics II](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Events					
WS 19/20	2521300	<a href="#">Non- and Semiparametrics</a>	2 SWS	Lecture (V)	Schienle
WS 19/20	2521301		2 SWS	Practice (Ü)	Schienle, Görgen
Exams					
WS 19/20	7900223	<a href="#">Non- and Semiparametrics</a>		Prüfung (PR)	Schienle
WS 19/20	7900227	<a href="#">Non- and Semiparametrics</a>		Prüfung (PR)	Schienle

**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 "*Applied Econometrics*" [2520020]

**Annotation**

The course takes place every second winter semester: 2018/19 then 2020/21

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

V

## Non- and Semiparametrics

2521300, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content****Learning objectives:**

The student

- has profound knowledge of non- and semiparametric estimation methods
- is capable of implementing these methods using statistical software and using them to assess empirical problems

**Content:**

Kernel density estimation, local constant and local linear regression, bandwidth choice, series and sieve estimators, additive models, semiparametric models

**Requirements:**

It is recommended to attend the course *Applied Econometrics* prior to this course.

**Workload:**

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

Exam preparation: 40 hours

**Literature**

Li, Racine: *Nonparametric Econometrics: Theory and Practice*. Princeton University Press, 2007.

T

## 6.194 Course: Nonlinear Optimization I [T-WIWI-102724]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	4

Events					
WS 19/20	2550111	<a href="#">Nonlinear Optimization I</a>	2 SWS	Lecture (V)	Stein
WS 19/20	2550112	<a href="#">Exercises Nonlinear Optimization I + II</a>	SWS	Practice (Ü)	Stein
Exams					
WS 19/20	7900002_WS1920_HK	<a href="#">Nonlinear Optimization I</a>		Prüfung (PR)	Stein

### 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 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 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

### Remark:

The treatment of optimization problems *with* constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

### Learning objectives:

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

**Literature**

O. Stein, 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

**6.195 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-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	9	Each winter term	6

Events					
WS 19/20	2550111	<a href="#">Nonlinear Optimization I</a>	2 SWS	Lecture (V)	Stein
WS 19/20	2550112	<a href="#">Exercises Nonlinear Optimization I + II</a>	SWS	Practice (Ü)	Stein
WS 19/20	2550113	<a href="#">Nonlinear Optimization II</a>	2 SWS	Lecture (V)	Stein
Exams					
WS 19/20	7900004_WS1920_HK	<a href="#">Nonlinear Optimization I and II</a>		Prüfung (PR)	Stein

**Competence Certificate**

The assessment consists of a written exam (120 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.

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:

**Nonlinear Optimization I**

2550111, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of optimization problems *with* constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

**Learning objectives:**

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

**Literature**

O. Stein, 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 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**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

**6.196 Course: Nonlinear Optimization II [T-WIWI-102725]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	3

Events					
WS 19/20	2550112	<a href="#">Exercises Nonlinear Optimization I + II</a>	SWS	Practice (Ü)	Stein
WS 19/20	2550113	<a href="#">Nonlinear Optimization II</a>	2 SWS	Lecture (V)	Stein
Exams					
WS 19/20	7900003_WS1920_HK	<a href="#">Nonlinear Optimization II</a>		Prüfung (PR)	Stein

**Competence Certificate**

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.

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:*

**Nonlinear Optimization II**

2550113, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**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

**6.197 Course: Operations Research in Health Care Management [T-WIWI-102884]**

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-102805 - Service Operations](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	2

Events					
SS 2020	2550495	<a href="#">Operations Research in Health Care Management</a>	2 SWS	Lecture (V)	Nickel
SS 2020	2550496	<a href="#">Übungen zu OR im Health Care Management</a>	1 SWS	Practice (Ü)	Bakker

**Competence Certificate**

The assessment is a 60 minutes written examination (according to §4(2), 1 of the examination regulation).  
The examination is held in the term of the lecture and the following lecture.

**Prerequisites**

None

**Recommendation**

Basic knowledge as conveyed in the module "Introduction to Operations Research" is assumed.

**Annotation**

The course is offered irregularly. Planned lectures for the next three years can be found in the internet at <http://dol.iior.kit.edu/english/Courses.php>.

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

V

**Operations Research in Health Care Management**

2550495, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature****Weiterführende Literatur:**

- Fleßa: Grundzüge der Krankenhausbetriebslehre, Oldenbourg, 2007
- Fleßa: Grundzüge der Krankenhaussteuerung, Oldenbourg, 2008
- Hall: Patient flow: reducing delay in healthcare delivery, Springer, 2006

T

**6.198 Course: Operations Research in Supply Chain Management [T-WIWI-102715]**

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)  
[M-WIWI-102805 - Service Operations](#)  
[M-WIWI-102832 - Operations Research in Supply Chain Management](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	2

Exams				
WS 19/20	7900288	<a href="#">Operations Research in Supply Chain Management</a>	Prüfung (PR)	Nickel

**Competence Certificate**

The assessment is a 60 minutes written examination (according to §4(2), 1 of the examination regulation).

The examination is held in the term of the lecture and the following lecture.

**Prerequisites**

None

**Recommendation**

Basic knowledge as conveyed in the module Introduction to Operations Research and in the lectures Facility Location and Strategic SCM, Tactical and operational SCM is assumed.

**Annotation**

The course is offered irregularly. Planned lectures for the next three years can be found in the internet at <http://dol.ior.kit.edu/english/Courses.php>.

T

## 6.199 Course: Optimization Models and Applications [T-WIWI-110162]

**Responsible:** Dr. Nathan Sudermann-Merx  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)  
[M-WIWI-102832 - Operations Research in Supply Chain Management](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2550140	<a href="#">Optimization Models and Application</a>	2 SWS	Lecture (V)	Stein, Sudermann-Merx
Exams					
WS 19/20	7900010_WS1920_HK	<a href="#">Optimization Models and Applications</a>		Prüfung (PR)	Stein

### Competence Certificate

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

The prerequisite for participation in the exam is the achievement of a minimum number of points in delivery sheets. Details will be announced at the beginning of the course.

### Prerequisites

None.

T

## 6.200 Course: Optimization under Uncertainty [T-WIWI-106545]

**Responsible:** Prof. Dr. Steffen Rebennack**Organisation:** KIT Department of Economics and Management**Part of:** [M-WIWI-103243 - Optimization under Uncertainty in Information Engineering and Management](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	2

Events					
WS 19/20	2550464	<a href="#">Optimierungsansätze unter Unsicherheit</a>	SWS	Lecture (V)	Rebennack
WS 19/20	2550465	<a href="#">Übungen zu Optimierungsansätze unter Unsicherheit</a>	SWS	Practice (Ü)	Rebennack, Füllner
WS 19/20	2550466		2 SWS	Practice (Ü)	Rebennack, Füllner
Exams					
WS 19/20	7900240	<a href="#">Optimization under Uncertainty</a>		Prüfung (PR)	Rebennack
WS 19/20	7900330	<a href="#">Optimization under Uncertainty</a>		Prüfung (PR)	Rebennack

**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

**6.201 Course: Panel Data [T-WIWI-103127]**

**Responsible:** apl. Prof. Dr. Wolf-Dieter Heller  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101638 - Econometrics and Statistics I](#)  
[M-WIWI-101639 - Econometrics and Statistics II](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2520320	<a href="#">Panel Data</a>	2 SWS	Lecture (V)	Heller
SS 2020	2520321	<a href="#">Übungen zu Paneldaten</a>	2 SWS	Practice (Ü)	Heller

**Prerequisites**

None

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

V

**Panel Data**2520320, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content****Content:**

Fixed-Effects-Models, Random-Effects-Models, Time-Demeaning

**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

**Literature**Wooldridge, J. M. (2002). *Econometric analysis of cross section and panel data*. Cambridge and London: MIT Press.Wooldridge, J. M. (2009). *Introductory Econometrics: A Modern Approach* (5th ed.). Mason, Ohio: South-Western Cengage Learning.

T

## 6.202 Course: Parallel Algorithms [T-INFO-101333]

**Responsible:** Prof. Dr. Peter Sanders**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-100796 - Parallel Algorithms](#)[M-INFO-101199 - Advanced Algorithms: Design and Analysis](#)[M-INFO-101200 - Advanced Algorithms: Engineering and Applications](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each winter term	1

Events					
WS 19/20	2400053	<a href="#">Parallel Algorithms</a>	2/1 SWS	Lecture (V)	Sanders, Hespe, Schreiber
Exams					
WS 19/20	75489	<a href="#">Parallel Algorithms</a>		Prüfung (PR)	Sanders

T

## 6.203 Course: Parallel Computer Systems and Parallel Programming [T-INFO-101345]

**Responsible:** Prof. Dr. Achim Streit  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101210 - Dynamic IT-Infrastructures](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2020	24617	<a href="#">Parallel computer systems and parallel programming</a>	2 SWS	Lecture (V)	Streit, Häfner
Exams					
WS 19/20	7500241	<a href="#">Parallel computer systems and parallel programming</a>		Prüfung (PR)	Streit

T

**6.204 Course: Parametric Optimization [T-WIWI-102855]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

**Competence Certificate**

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation. The examination is held in the semester of the lecture and in the following semester.

Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

**Prerequisites**

None

**Recommendation**

It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

**Annotation**

The lecture is offered irregularly. The curriculum of the next three years is available online ([www.ior.kit.edu](http://www.ior.kit.edu)).



T

**6.205 Course: Patent Law [T-INFO-101310]**

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101215 - Intellectual Property Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	2

Events					
SS 2020	24656	<a href="#">Patent Law</a>	2 SWS	Lecture (V)	Koch
Exams					
WS 19/20	7500001	<a href="#">Patent Law</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500062	<a href="#">Patent Law</a>		Prüfung (PR)	Dreier, Matz

T

**6.206 Course: Pattern Recognition [T-INFO-101362]**

**Responsible:** Prof. Dr.-Ing. Jürgen Beyerer  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100825 - Pattern Recognition](#)  
[M-INFO-101239 - Machine Vision](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	24675	<a href="#">Pattern Recognition</a>	2 SWS	Lecture (V)	Beyerer
Exams					
WS 19/20	7500111	<a href="#">Pattern Recognition</a>		Prüfung (PR)	Beyerer
SS 2020	7500032	<a href="#">Pattern Recognition</a>		Prüfung (PR)	Beyerer

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

V

**Pattern Recognition**

24675, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature****Weiterführende Literatur**

- Richard O. Duda, Peter E. Hart, Stork G. David. Pattern Classification. Wiley-Interscience, second edition, 2001
- K. Fukunaga. Introduction to Statistical Pattern Recognition. Academic Press, second edition, 1997
- R. Hoffman. Signalanalyse und -erkennung. Springer, 1998
- H. Niemann. Pattern analysis and understanding. Springer, second edition, 1990
- J. Schürmann. Pattern classification. Wiley & Sons, 1996
- S. Theodoridis, K. Koutroumbas. Pattern recognition. London: Academic, 2003
- V. N. Vapnik. The nature of statistical learning theory. Springer, second edition, 2000

## T

**6.207 Course: Personalization and Services [T-WIWI-102848]**

**Responsible:** Dr.-Ing. Andreas Sonnenbichler  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101410 - Business & Service Engineering](#)  
[M-WIWI-101470 - Data Science: Advanced CRM](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2540533	<a href="#">Personalization &amp; Services</a>	2 SWS	Lecture (V)	Sonnenbichler, Geyer-Schulz
WS 19/20	2540534	<a href="#">Exercise Personalization &amp; Services</a>	1 SWS	Practice (Ü)	Sonnenbichler, Geyer-Schulz
Exams					
WS 19/20	7979702	<a href="#">Personalization and Services</a>		Prüfung (PR)	Geyer-Schulz

**Competence Certificate**

Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.

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

**Prerequisites**

None

**Recommendation**

None

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

## V

**Personalization & Services**

2540533, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

Die Vorlesung orientiert sich an aktuellen wissenschaftlichen Veröffentlichungen. Die Literaturliste finden Sie nach Themen gegliedert jeweils am Ende der Vorlesungseinheiten.

T

**6.208 Course: Planning and Management of Industrial Plants [T-WIWI-102631]**

**Responsible:** Prof. Dr. Frank Schultmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101471 - Industrial Production II](#)

Type	Credits	Recurrence	Version
Written examination	5,5	Each winter term	1

Events					
WS 19/20	2581952	<a href="#">Planning and Management of Industrial Plants</a>	2 SWS	Lecture (V)	Glöser-Chahoud, Schultmann
WS 19/20	2581953	<a href="#">Übungen Anlagenwirtschaft</a>	2 SWS	Practice (Ü)	Rosenberg, Schultmann
Exams					
WS 19/20	7981952	<a href="#">Planning and Management of Industrial Plants</a>		Prüfung (PR)	Schultmann

**Competence Certificate**

The assessment consists of a written exam (90 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**

None

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

V

**Planning and Management of Industrial Plants**2581952, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

Industrial plant management incorporates a complex set of tasks along the entire life cycle of an industrial plant, starting with the initiation and erection up to operating and dismantling.

During this course students will get to know special characteristics of industrial plant management. Students will learn important methods to plan, realize and supervise the supply, start-up, maintenance, optimisation and shut-down of industrial plants. Alongside, students will have to handle the inherent question of choosing between technologies and evaluating each of them. This course pays special attention to the specific characteristics of plant engineering, commissioning and investment.

**Literature**

Wird in der Veranstaltung bekannt gegeben.

T

## 6.209 Course: Portfolio and Asset Liability Management [T-WIWI-103128]

**Responsible:** Dr. Mher Safarian  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101639 - Econometrics and Statistics II](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2520357	<a href="#">Portfolio and Asset Liability Management</a>	2 SWS	Lecture (V)	Safarian
SS 2020	2520358	<a href="#">Übungen zu Portfolio and Asset Liability Management</a>	2 SWS	Practice (Ü)	Safarian

### Competence Certificate

The assessment of this course consists of a written examination (following §4(2), 1 SPOs, 180 min.).

### Prerequisites

None

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

V

### Portfolio and Asset Liability Management

2520357, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Content

#### Learning objectives:

Knowledge of various portfolio management techniques in the financial industry.

#### Content:

Portfolio theory: principles of investment, Markowitz- portfolio analysis, Modigliani-Miller theorems and absence of arbitrage, efficient markets, capital asset pricing model (CAPM), multi factorial CAPM, arbitragepricing theory (APT), arbitrage and hedging, multi factorial models, equity-portfolio management, passive strategies, active investment

Asset liability: statistical portfolio analysis in stock allocation, measures of success, dynamic multi seasonal models, models in building scenarios, stochastic programming in bond and liability management, optimal investment strategies, integrated asset liability management

#### 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

### Literature

To be announced in the lecture

T

## 6.210 Course: Practical Course Computer Vision for Human-Computer Interaction [T-INFO-105943]

**Responsible:** Prof. Dr.-Ing. Rainer Stiefelhagen

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101239 - Machine Vision](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each summer term	2

Exams				
WS 19/20	7500136	<a href="#">Practical Course Computer Vision for Human-Computer Interaction</a>	Prüfung (PR)	Stiefelhagen

T

**6.211 Course: Practical Course Protocol Engineering [T-INFO-104386]**

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101206 - Networking](#)

Type	Credits	Recurrence	Version
Examination of another type	4	Each winter term	1

Events					
WS 19/20	2400086	<a href="#">Protocol Engineering</a>	4 SWS	Practical course (P)	Bauer, Zitterbart
Exams					
WS 19/20	7500002	<a href="#">Practical Course Protocol Engineering</a>		Prüfung (PR)	Zitterbart

T

**6.212 Course: Practical Course: Analysis of Complex Data Sets [T-INFO-105796]**

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101256 - Theory and Practice of Data Warehousing and Mining](#)  
[M-INFO-102807 - Practical Course: Analysis of Complex Data Sets](#)

Type	Credits	Recurrence	Version
Completed coursework	4	Irregular	1



T

**6.213 Course: Practical Course: Database Systems [T-INFO-103201]**

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101256 - Theory and Practice of Data Warehousing and Mining](#)  
[M-INFO-101662 - Practical Course: Database Systems](#)

Type	Credits	Recurrence	Version
Completed coursework	4	Each winter term	2

Events					
WS 19/20	24286	<a href="#">Datenbankpraktikum</a>	2 SWS	Practical course (P)	Schäler, Böhm
Exams					
WS 19/20	7500130	<a href="#">Practical Course Database Systems</a>		Prüfung (PR)	Böhm

T

**6.214 Course: Practical Course: Geometric Modeling [T-INFO-103207]**

**Responsible:** Prof. Dr. Hartmut Prautzsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101666 - Practical Course: Geometric Modeling](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each winter term	1

Events					
WS 19/20	2400024	<a href="#">Praktikum</a>	SWS	Practical course (P)	Xu, Prautzsch
SS 2020	2400026	<a href="#">Praktikum Unterteilungsalgorithmen</a>	2 SWS	Practical course (P)	Prautzsch, Xu
SS 2020	2400107	<a href="#">Praktikum Geometrisches Modellieren</a>	2 SWS	Practical course (P)	Prautzsch, Xu
Exams					
WS 19/20	7500268	<a href="#">Practical course: Geometric Modeling</a>		Prüfung (PR)	Prautzsch

T

**6.215 Course: Practical Course: Implementation and Evaluation of Advanced Data Mining Approaches for Semi-Structured Data [T-INFO-106219]**

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101256 - Theory and Practice of Data Warehousing and Mining](#)  
[M-INFO-103128 - Practical Course: Implementation and Evaluation of Advanced Data Mining Approaches for Semi-Structured Data](#)

Type	Credits	Recurrence	Version
Completed coursework	4	Irregular	1

T

**6.216 Course: Practical Course: Smart Data Analytics [T-INFO-106426]**

**Responsible:** Prof. Dr.-Ing. Michael Beigl  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-103235 - Practical Course: Smart Data Analytics](#)

Type	Credits	Recurrence	Version
Examination of another type	6	Each summer term	1

Events					
SS 2020	24895	<a href="#">Practical Course: Smart Data Analytics</a>	4 SWS	Practical course (P)	Beigl, Riedel, Ravivanpong, Zhou

T

## 6.217 Course: Practical Course: Web Applications and Service-Oriented Architectures (II) [T-INFO-103121]

**Responsible:** Prof. Dr. Sebastian Abeck  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-104061 - Microservice-Based Web Applications](#)

Type	Credits	Recurrence	Version
Examination of another type	5	Each summer term	2

Events					
SS 2020	24873	<a href="#">Practical Course: Web Applications and Service-Oriented Architectures (II)</a>	2 SWS	Practical course (P)	Abeck, Schneider

T

**6.218 Course: Practical Seminar Digital Service Systems [T-WIWI-106563]**

**Responsible:** Prof. Dr. Gerhard Satzger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-102808 - Digital Service Systems in Industry](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Irregular	1

Events					
WS 19/20	2540554	<a href="#">Practical Seminar: Information Systems &amp; Service Design</a>	2 SWS	Lecture (V)	Mädche
SS 2020	2540554	<a href="#">Practical Seminar: Information Systems &amp; Service Design (Master)</a>	3 SWS	Lecture (V)	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**

New course title starting summer term 2017: "Practical Seminar Digital Service Systems".  
 The current range of seminar topics is announced on the KSRI website [www.ksri.kit.edu](http://www.ksri.kit.edu).

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

V

**Practical Seminar: Information Systems & Service Design**2540554, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

V

**Practical Seminar: Information Systems & Service Design (Master)**2540554, SS 2020, 3 SWS, [Open in study portal](#)

Lecture (V)

**Content**

In this practical seminar, students get an individual assignment and develop a running software prototype. Beside the software prototype, the students also deliver a written documentation.

**Prerequisites**

Profound skills in software development are required

**Literature**

Further literature will be made available in the seminar.

T

**6.219 Course: Practical Seminar: Advanced Analytics [T-WIWI-108765]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103118 - Data Science: Data-Driven User Modeling](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each term	1

**Competence Certificate**

The assessment consists of practical work in the field of advanced analytics, 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**

At least one module offered by the institute should have been chosen before attending this seminar.

**Annotation**

The course is held in English. The course is not offered regularly.

T

**6.220 Course: Practical Seminar: Data-Driven Information Systems [T-WIWI-106207]**

**Responsible:** Prof. Dr. Alexander Mädche  
 Prof. Dr. Gerhard Satzger  
 Prof. Dr. Thomas Setzer  
 Prof. Dr. Christof Weinhardt

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

**Part of:** [M-WIWI-103117 - Data Science: Data-Driven Information Systems](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Irregular	1

**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**

At least one module offered by the institute should have been chosen before attending this seminar.

**Annotation**

The course is held in english. The course is not offered regularly.



T

## 6.221 Course: Practical Seminar: Health Care Management (with Case Studies) [T-WIWI-102716]

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-102805 - Service Operations](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each term	2

Events					
SS 2020	2550498	<a href="#">Practical seminar: Health Care Management</a>	3 SWS	Practical course (P)	Nickel, Mitarbeiter

### Competence Certificate

Due to a research semester of Professor Nickel in WS 19/20, the courses *Location Planning and Strategic SCM* and *Practice Seminar: Health Care Management* do NOT take place in WS 19/20. Please also refer to the information at <https://dol.iior.kit.edu/Lehrveranstaltungen.php> for further details.

The assessment consists in a case study, the writing of a corresponding paper, and an oral exam (according to §4(2), 2 of the examination regulation).

### Prerequisites

None.

### Recommendation

Basic knowledge as conveyed in the module *Introduction to Operations Research* is assumed.

### Annotation

The credits have been reduced to 4,5 starting summer term 2016.

The lecture is offered every term.

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

T

## 6.222 Course: Practical Seminar: Information Systems and Service Design [T-WIWI-108437]

**Responsible:** Prof. Dr. Alexander Mädche  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-102806 - Service Innovation, Design & Engineering](#)  
[M-WIWI-104068 - Information Systems in Organizations](#)  
[M-WIWI-104080 - Designing Interactive Information Systems](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each term	2

Events					
SS 2020	2540554	<a href="#">Practical Seminar: Information Systems &amp; Service Design (Master)</a>	3 SWS	Lecture (V)	Mädche
Exams					
WS 19/20	7900332	<a href="#">Practical Seminar: Information Systems and Service Design</a>		Prüfung (PR)	Mädche

### 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 practical components and an active participation in class. Please take into account that, beside the written documentation, also a practical component (e.g. implementation of a prototype) is part of the course. Please examine the course description for the particular tasks. The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class). In the winter terms, the course is only offered as a seminar.

### Prerequisites

None.

### Recommendation

Attending the course „Digital Service Design“ is recommended, but not mandatory.

### Annotation

The course is held in English.

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

V

### Practical Seminar: Information Systems & Service Design (Master)

2540554, SS 2020, 3 SWS, [Open in study portal](#)

Lecture (V)

### Content

In this practical seminar, students get an individual assignment and develop a running software prototype. Beside the software prototype, the students also deliver a written documentation.

### Prerequisites

Profound skills in software development are required

### Literature

Further literature will be made available in the seminar.

T

**6.223 Course: Practical Seminar: Service Innovation [T-WIWI-110887]**

**Responsible:** Prof. Dr. Gerhard Satzger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101410 - Business & Service Engineering](#)  
[M-WIWI-102806 - Service Innovation, Design & Engineering](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Irregular	1

Events					
WS 19/20	2595477	<a href="#">Seminarpraktikum: Service Innovation</a>	3 SWS	Seminar (S)	Satzger

**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 practical components and an active participation in class.

Please take into account that, beside the written documentation, also a practical component (such as a survey or an implementation of an application) is part of the course. Please examine the course description for the particular tasks.

The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class).

**Prerequisites**

None

**Recommendation**

Knowledge of Service Innovation Methods is assumed. Therefore it is recommended to attend the course Service Innovation [2540468] beforehand.

**Annotation**

Due to the project work, the number of participants is limited and participation requires knowledge about models, concepts and approaches that are taught in the Service Innovation lecture. Having taken the Service Innovation lecture or demonstrating equivalent knowledge is a prerequisite for participating in this Practical Seminar. Details for registration will be announced on the web pages for this course.

The seminar is not offered regularly.

## T

## 6.224 Course: Predictive Mechanism and Market Design [T-WIWI-102862]

**Responsible:** Prof. Dr. Johannes Philipp Reiß  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101453 - Applied Strategic Decisions](#)  
[M-WIWI-101505 - Experimental Economics](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Events					
WS 19/20	2520402	<a href="#">Predictive Mechanism and Market Design</a>	2 SWS	Lecture (V)	Reiß
WS 19/20	2520403		SWS	Practice (Ü)	Reiß
Exams					
WS 19/20	7900318	<a href="#">Predictive Mechanism and Market Design</a>		Prüfung (PR)	Reiß

**Competence Certificate**

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

**Prerequisites**

None

**Annotation**

The course is given every second fall term, e.g., WS2017/18, WS2019/20, ...

The retake exam is given in the summer term subsequent to the fall term where the course (lecture and final exam) is given.

T

**6.225 Course: Predictive Modeling [T-WIWI-110868]**

**Responsible:** Jun.-Prof. Dr. Fabian Krüger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101638 - Econometrics and Statistics I](#)  
[M-WIWI-101639 - Econometrics and Statistics II](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2521311	<a href="#">Predictive Modeling</a>	2 SWS	Lecture (V)	Krüger
SS 2020	2521312	<a href="#">Predictive Modeling (Tutorial)</a>	2 SWS	Practice (Ü)	Krüger

**Competence Certificate**

The assessment of this course is a written examination (90 min) according to §4(2), 1 of the examination regulation. A bonus can be acquired through an additional performance (short presentation). If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). Details will be announced in the lecture.

**Prerequisites**

None

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

V

**Predictive Modeling**2521311, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

- Elliott, G., und A. Timmermann (Hsg.): "Handbook of Economic Forecasting", vol. 2A und 2B, 2013.
- Gneiting, T., und M. Katzfuss: "Probabilistic Forecasting", Annual Review of Statistics and Its Application 1, 125-151, 2014.
- Hansen, B.E.: "Econometrics", Online-Text (<https://www.ssc.wisc.edu/~bhansen/econometrics>), 2020.
- Hastie, T., Tibshirani, R., and J. Friedman: "The Elements of Statistical Learning", 2. Ausgabe, Springer, 2009.
- Weitere Literatur wird in der Vorlesung bekanntgegeben.

V

**Predictive Modeling (Tutorial)**2521312, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

T

**6.226 Course: Price Management [T-WIWI-105946]**

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
Dr Paul Glenn

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

**Part of:** [M-WIWI-101409 - Electronic Markets](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2540529	<a href="#">Price Management</a>	2 SWS	Lecture (V)	Glenn
SS 2020	2540530	<a href="#">Exercise Price Management</a>	1 SWS	Practice (Ü)	Glenn

**Competence Certificate**

Lecture and exam will not be offered in summer semester 2019. The next examination is in the summer semester 2020.

Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.

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

**Prerequisites**

None

**Recommendation**

None

**Annotation**

The lecture is offered for the first time in summer term 2016.

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

V

**Price Management**

2540529, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

- H. Simon and M. Fassnacht, *Preismanagement*, vol. 4. Wiesbaden: Springer Gabler, 2016.
- T. T. Nagle, J. E. Hogan, und J. Zalee, *The Strategy and Tactics of Pricing: A guide to growing more profitably*. New Jersey: Prentice Hall, 2010.

T

## 6.227 Course: Price Negotiation and Sales Presentations [T-WIWI-102891]

**Responsible:** Prof. Dr. Martin Klarmann  
Mark Schröder

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

**Part of:** [M-WIWI-105312 - Marketing and Sales Management](#)

Type	Credits	Recurrence	Version
Examination of another type	1,5	Each winter term	3

Events					
WS 19/20	2572198	<a href="#">Price Negotiation and Sales Presentations</a>	1 SWS	Block (B)	Klarmann, Schröder
Exams					
WS 19/20	7900148	<a href="#">Price Negotiation and Sales Presentations</a>		Prüfung (PR)	Klarmann

### Competence Certificate

This alternative exam assessment consists of a presentation with a subsequent discussion totalling 25 minutes. Moreover learning contents are checked by realistic 30-minute price negotiations.

### Prerequisites

None

### Recommendation

None

### Annotation

Participation requires an application. The application period starts at the beginning of the semester. More information can be obtained on the website of the research group Marketing & Sales ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)).

Access to this course is restricted. Typically all students will be granted the attendance of one course with 1.5 ECTS. Nevertheless attendance can not be guaranteed.

For further information please contact Marketing and Sales Research Group ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)).

Please note that only one of the courses from the election block can be attended in the module.

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

V

## Price Negotiation and Sales Presentations

2572198, WS 19/20, 1 SWS, Language: German, [Open in study portal](#)

Block (B)

### Content

At first, theoretical knowledge about the behavior in selling contexts is discussed. Then, in a practical part, students will apply this knowledge in their own price negotiations.

Students

- gain a clear impression of the theoretical knowledge about price negotiations and sales presentations
- improve their own negotiation abilities

Non exam assessment (following §4(2), 3 of the examination regulation).

The total workload for this course is approximately 45.0 hours. For further information see German version.

- In order to participate in this course, you need to apply. Applications usually start with the lecture period in the winter term. Detailed information on the application process is provided on the website of the Marketing and Sales Research Group ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)) shortly before the lecture period in winter term starts.
- Please note that only one of the 1.5 ECTS courses can be chosen in the module.
- Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1,5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.

## T

## 6.228 Course: Pricing [T-WIWI-102883]

**Responsible:** Dr. Sven Feurer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101510 - Cross-Functional Management Accounting](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2572157	<a href="#">Pricing</a>	2 SWS	Lecture (V)	Klarmann
WS 19/20	2572169	<a href="#">Übung zu Pricing</a>	1 SWS	Practice (Ü)	Moosbrugger
Exams					
WS 19/20	7900138	<a href="#">Pricing</a>		Prüfung (PR)	Klarmann
WS 19/20	7900286	<a href="#">Pricing</a>		Prüfung (PR)	Klarmann

**Competence Certificate**

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

**Prerequisites**

None

**Recommendation**

None

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

## V

**Pricing**

2572157, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

This course addresses central elements and peculiarities of pricing goods and services. The topics are below others:

- Price demand functions
- Concept of the price elasticity of demand
- Key concepts of behavioral pricing
- Decision-making areas in pricing

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

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

For further information please contact Marketing & Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

**Literature**

Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.

Simon, Hermann, Fassnacht, Martin (2008), Preismanagement, 3. Aufl., Wiesbaden.



T

**6.229 Course: Product and Innovation Management [T-WIWI-109864]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101510 - Cross-Functional Management Accounting](#)  
[M-WIWI-101514 - Innovation Economics](#)  
[M-WIWI-105312 - Marketing and Sales Management](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	2571154	<a href="#">Product and Innovation Management</a>	2 SWS	Lecture (V)	Feurer

**Competence Certificate**

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

**Prerequisites**

None

**Annotation**

For further information please contact Marketing & Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

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

V

**Product and Innovation Management**

2571154, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

This course addresses topics around the management of new as well as existing products. After the foundations of product management, especially the product choice behavior of customers, students get to know in detail different steps of the innovation process. Another section regards the management of the existing product portfolio.

**Students**

- know the most important terms of the product and innovation concept
- understand the models of product choice behavior (e.g., the Markov model, the Luce model)
- are familiar with the basics of network theory (e.g. the Triadic Closure concept)
- know the central strategic concepts of innovation management (especially the market driving approach, pioneer and successor, Miles/Snow typology, blockbuster strategy)
- master the most important methods and sources of idea generation (e.g. open innovation, lead user method, crowdsourcing, creativity techniques, voice of the customer, innovation games, conjoint analysis, quality function deployment, online toolkits)
- are capable of defining and evaluating new product concepts and know the associated instruments like focus groups, product testing, speculative sales, test market simulation Assessor, electronic micro test market
- have advanced knowledge about market introduction (e.g. adoption and diffusion models Bass, Fourt/Woodlock, Mansfield)
- understand important connections of the innovation process (cluster formation, innovation culture, teams, stage-gate process)

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Total effort for 3 credit points: approx. 90 hours

Presence time: 30 hours

Preparation and wrap-up of LV: 45.0 hours

Exam and exam preparation: 15.0 hours

For further information please contact Marketing & Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

**Literature**

Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.

T

## 6.230 Course: Production and Logistics Management [T-WIWI-102632]

**Responsible:** Dr.-Ing. Simon Glöser-Chahoud  
Prof. Dr. Frank Schultmann

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

**Part of:** [M-WIWI-101412 - Industrial Production III](#)

Type	Credits	Recurrence	Version
Written examination	5,5	Each summer term	1

Events					
SS 2020	2581954	<a href="#">Production and Logistics Management</a>	2 SWS	Lecture (V)	Schultmann, Glöser-Chahoud
SS 2020	2581955	<a href="#">Übung zu Produktions- und Logistikmanagement</a>	2 SWS	Practice (Ü)	Zimmer, Huster
Exams					
WS 19/20	7981954	<a href="#">Production and Logistics Management</a>		Prüfung (PR)	Schultmann

### Competence Certificate

The assessment consists of a written exam (90 minutes) (following § 4(2), 1 of the examination regulation). The exam takes place in every semester. Reexaminations are offered at every ordinary examination date.

### Prerequisites

None

### Recommendation

None

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

V

## Production and Logistics Management

2581954, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

This course covers central tasks and challenges of operative production and logistics management. Students get to know the set-up and mode of planning systems such as production planning and control systems, enterprise resource planning systems and advanced planning systems to cope with the accompanying planning tasks in supply chain management. Methods to solve these tasks from the field of operational research will be explored with respect to manufacturing program planning, material requirement planning, lot size problems and scheduling. Alongside to MRP II (Manufacturing Resources Planning), students will be introduced to integrated supply chain management approaches. Finally, commercially available planning systems will be presented and discussed.

### Literature

Wird in der Veranstaltung bekannt gegeben.

## T

## 6.231 Course: Project Lab Cognitive Automobiles and Robots [T-WIWI-109985]

**Responsible:** Prof. Dr.-Ing. Johann Marius Zöllner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103356 - Machine Learning](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each winter term	2

Events					
WS 19/20	2512501	<a href="#">Project lab Cognitive automobiles and robots</a>	3 SWS	Practical course (P)	Zöllner
SS 2020	2513500	<a href="#">Cognitive Automobiles and Robots</a>	2 SWS	Seminar (S)	Zöllner
Exams					
WS 19/20	7900107	<a href="#">Advanced Lab Cognitive Automobile and Robots</a>		Prüfung (PR)	Zöllner
SS 2020	7900147	<a href="#">Cognitive Automobiles and Robots</a>		Prüfung (PR)	Zöllner

**Competence Certificate**

The alternative exam assessment consists of:

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

Details of the grade formation will be announced at the beginning of the course.

**Prerequisites**

None

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

## V

**Project lab Cognitive automobiles and robots**

2512501, WS 19/20, 3 SWS, Language: German/English, [Open in study portal](#)

**Practical course (P)**

**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.

**Cognitive Automobiles and Robots**2513500, SS 2020, 2 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)****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.

T

**6.232 Course: Project Lab Machine Learning [T-WIWI-109983]**

**Responsible:** Prof. Dr.-Ing. Johann Marius Zöllner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103356 - Machine Learning](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	2

Events					
SS 2020	2512500	<a href="#">Project Lab Machine Learning</a>	3 SWS	Practical course (P)	Zöllner
Exams					
SS 2020	7900086	<a href="#">Project Lab Machine Learning</a>		Prüfung (PR)	Zöllner

**Competence Certificate**

The alternative exam assessment consists of:

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

Details of the grade formation will be announced at the beginning of the course.

**Prerequisites**

None

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

V

**Project Lab Machine Learning**

2512500, SS 2020, 3 SWS, Language: German/English, [Open in study portal](#)

**Practical course (P)**

**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.

**6.233 Course: Project Management [T-WIWI-103134]**

**Responsible:** Prof. Dr. Frank Schultmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101412 - Industrial Production III](#)  
[M-WIWI-101471 - Industrial Production II](#)

Type	Credits	Recurrence	Version
Written examination	3,5	Each winter term	1

Events					
WS 19/20	2581963	<a href="#">Project Management</a>	2 SWS	Lecture (V)	Schultmann, Volk, Wiens, Schumacher, Rosenberg, Wehrle
WS 19/20	2581964	<a href="#">Übung zu Project Management</a>	1 SWS	Practice (Ü)	Volk, Wiens, Schumacher, Rosenberg, Wehrle
Exams					
WS 19/20	7981963	<a href="#">Project Management</a>		Prüfung (PR)	Schultmann

**Competence Certificate**

The examination will be in form of a written exam acc. to §4(2), 1 ER. Exams are offered in every semester and can be re-examined at every ordinary examination date.

**Prerequisites**

None

**Recommendation**

None

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

**Project Management**

2581963, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

1. Introduction
2. Principles of Project Management
3. Project Scope Management
4. Time Management and Resource Scheduling
5. Cost Management
6. Quality Management
7. Risk Management
8. Stakeholder
9. Communication, Negotiation and Leadership
10. Project Controlling
11. Agile Project Management

**Literature**

Wird in der Veranstaltung bekannt gegeben.

T

**6.234 Course: Project Management in Practice [T-INFO-101976]****Responsible:** Prof. Dr.-Ing. Klemens Böhm**Organisation:** KIT Department of Informatics**Part of:** [M-INFO-101208 - Innovative Concepts of Data and Information Management](#)

Type	Credits	Recurrence	Version
Completed coursework	1,5	Irregular	1

Events					
SS 2020	2400019	<a href="#">Project Management in Practice</a>	2 SWS	Lecture (V)	Böhm, Schnober

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

V

**Project Management in Practice**2400019, SS 2020, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)****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, activity 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)



T

## 6.235 Course: Provable Security in Cryptography [T-INFO-101259]

**Responsible:** Prof. Dr. Dennis Hofheinz  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101198 - Advanced Topics in Cryptography](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each winter term	1

Exams				
WS 19/20	7500093	<a href="#">Provable Security in Cryptography</a>	Prüfung (PR)	Geiselman, Hofheinz, Müller-Quade

T

**6.236 Course: Public Management [T-WIWI-102740]**

**Responsible:** Prof. Dr. Berthold Wigger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101504 - Collective Decision Making](#)  
[M-WIWI-101511 - Advanced Topics in Public Finance](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2561127	<a href="#">Public Management</a>	3 SWS	Lecture / Practice (VÜ)	Wigger

**Competence Certificate**

The assessment consists of an 1h written exam following Art. 4, para. 2, clause 1 of the examination regulation. The grade for this course equals the grade of the written exam.

**Prerequisites**

None

**Recommendation**

Basic knowledge of Public Finance is required.

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

V

**Public Management**

2561127, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

**Literature****Weiterführende Literatur:**

- Damkowski, W. und C. Precht (1995): Public Management; Kohlhammer
- Richter, R. und E.G. Furubotn (2003): Neue Institutionenökonomik; 3. Auflage, Mohr
- Schedler, K. und I. Proeller (2003): New Public Management; 2. Auflage; UTB
- Mueller, D.C. (2009): Public Choice III; Cambridge University Press
- Wigger, B.U. (2006): Grundzüge der Finanzwissenschaft; 2. Auflage; Springer

T

**6.237 Course: Public Media Law [T-INFO-101311]**

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101217 - Public Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	24082	<a href="#">Public Media Law</a>	2 SWS	Lecture (V)	Kirchberg
Exams					
WS 19/20	7500062	<a href="#">Public Media Law</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500058	<a href="#">Public Media Law</a>		Prüfung (PR)	Dreier, Matz

T

**6.238 Course: Public Revenues [T-WIWI-102739]**

**Responsible:** Prof. Dr. Berthold Wigger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101511 - Advanced Topics in Public Finance](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2560120	<a href="#">Public Revenues</a>	2 SWS	Lecture (V)	Wigger
SS 2020	2560121	<a href="#">Übung zu Öffentliche Einnahmen</a>	1 SWS	Practice (Ü)	Wigger

**Competence Certificate**

The assessment consists of an 1h written exam following Art. 4, para. 2, clause 1 of the examination regulation. The grade for this course equals the grade of the written exam.

**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 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The *Public Revenues* lecture is concerned with the theory and policy of taxation and public dept. In the first chapter, fundamental concepts of taxation theory are introduced, whereas the second chapter deals with key elements of the German taxation system. The allocative and distributive effects of different taxation types are examined in chapter three and four. Chapter five integrates both allocative and distributive components in order to derive a theory of optimal taxation. The core of the sixth chapter is represented by international aspects of taxation. The debt part begins with a description of the extent and structure of public dept in chapter seven. In the following chapter, macroeconomic theories of national dept are evolved, while chapter nine is concerned with its long term consequences when employed as a regular instrument of budgeting. Finally, the tenth chapter deals with constitutional limits to public debt-incurring.

**Learning goals:**

See German version.

**Workload:**

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

**Literature****Literatur:**

- Homburg, S.(2000): *Allgemeine Steuerlehre*, Vahlen
- Rosen, H.S.(1995): *Public Finance*; 4. Aufl., Irwin
- Wellisch, D.(2000): *Finanzwissenschaft I und Finanzwissenschaft III*, Vahlen
- Wigger, B. U.(2006): *Grundzüge der Finanzwissenschaft*; 2. Aufl., Springer

T

## 6.239 Course: Python for Computational Risk and Asset Management [T-WIWI-110213]

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-105032 - Data Science for Finance](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each winter term	1

Events					
WS 19/20	2500016	<a href="#">Python for Computational Risk and Asset Management</a>	2 SWS	Practical course (P)	Ulrich
Exams					
WS 19/20	7900220	<a href="#">Python for Computational Risk and Asset Management</a>		Prüfung (PR)	Ulrich

### Competence Certificate

The assessment is carried out in form of twelve weekly Python programming tasks and offered each winter term. The grade of this course is determined by the points achieved in the programming tasks.

### Prerequisites

None.

### Recommendation

Good knowledge of statistics and first programming experience with Python is recommended.

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

V

## Python for Computational Risk and Asset Management

2500016, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Practical course (P)

### Content

The aim of this course is to provide students with strong knowledge in Python to independently solve real-world data problems related to automated robo investment advisory.

The course covers several topics from a programming perspective, among them:

Quantitative Portfolio Strategies: Extensions to Mean-Variance Portfolio Optimization

Return Densities: Forecasting with Traditional and Machine Learning Approaches, Monte Carlo Simulation

Financial Economics: Rationalizing Risk Premiums via Stochastic Discount Factor

Multi-Asset Valuation: DCF Approach, No-Arbitrage and Ito Calculus

The total workload for this course is approximately 90 hours.

Prior knowledge of AIFB programming and KIT statistics classes is recommended.

The course introduces students to Python. Students will solve problems related to the agenda of the lecture 'Computational Risk and Asset Management'. This enables them to work with financial data, perform various statistical analysis and estimate their own time series models.

T

## 6.240 Course: Quantitative Methods in Energy Economics [T-WIWI-107446]

**Responsible:** Dr. Dogan Keles  
Patrick Plötz

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

**Part of:** [M-WIWI-101451 - Energy Economics and Energy Markets](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2581007	<a href="#">Quantitative Methods in Energy Economics</a>	2 SWS	Lecture (V)	Plötz, Keles
WS 19/20	2581008	<a href="#">Übung zu Quantitative Methods in Energy Economics</a>	1 SWS	Practice (Ü)	Plötz
Exams					
WS 19/20	7981007	<a href="#">Quantitative Methods in Energy Economics</a>		Prüfung (PR)	Fichtner

### Competence Certificate

The assessment consists of a written exam (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

None

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

V

## Quantitative Methods in Energy Economics

2581007, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Content

Energy economics makes use of many quantitative methods in exploration and analysis of data as well as in simulations and modelling. This lecture course aims at introducing students of energy economics into the application of quantitative methods and techniques as taught in elementary courses to real problems in energy economics. The focus is mainly on regression, simulation, time series analysis and related statistical methods as applied in energy economics.

Learning Goals:

The student

- knows and understands selected quantitative methods of energy economics
- is able to use selected quantitative methods of energy economics
- understands they range of usage, limits and is autonomously able to adress new problems by them.

### Literature

Wird in der Vorlesung bekannt gegeben.

T

**6.241 Course: Randomized Algorithms [T-INFO-101331]****Responsible:** Thomas Worsch**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-100794 - Randomized Algorithms](#)  
[M-INFO-101199 - Advanced Algorithms: Design and Analysis](#)  
[M-INFO-101200 - Advanced Algorithms: Engineering and Applications](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each winter term	1

Events					
WS 19/20	24171	<a href="#">Randomized Algorithms</a>	3 SWS	Lecture / Practice (VÜ)	Worsch
Exams					
WS 19/20	75400002	<a href="#">Randomized Algorithms</a>		Prüfung (PR)	Worsch

T

**6.242 Course: Real World Lab: Innovation Communication [T-WIWI-110920]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-105312 - Marketing and Sales Management](#)

Type	Credits	Recurrence	Version
Examination of another type	1,5	Once	1

**Competence Certificate**

Alternative exam assessment (two team presentations).

**Annotation**

Please note that only one of the courses from the election block can be chosen in the module. Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1.5 ECTS points in the respective module to all students. Participation in a specific course cannot be guaranteed. In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in summer term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group ([marketing.iism.kit.edu](http://marketing.iism.kit.edu)) shortly before the lecture period in summer term starts.



T

**6.243 Course: Recommender Systems [T-WIWI-102847]**

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101410 - Business & Service Engineering](#)  
[M-WIWI-101470 - Data Science: Advanced CRM](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2540506	<a href="#">Recommender Systems</a>	2 SWS	Lecture (V)	Geyer-Schulz
SS 2020	2540507	<a href="#">Exercise Recommender Systems</a>	1 SWS	Practice (Ü)	Nazemi

**Competence Certificate**

Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.

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

**Prerequisites**

None

**Recommendation**

None

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

V

**Recommender Systems**

2540506, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

At first, an overview of general aspects and concepts of recommender systems and its relevance for service providers and customers is given. Next, different categories of recommender systems are discussed. This includes explicit recommendations like customer reviews as well as implicit services based on behavioral data. Furthermore, the course gives a detailed view of the current research on recommender systems at the Chair of Information Services and Electronic Markets.

**Learning objectives:**

The student

- is proficient in different statistical, data-mining, and game theory methods of computing implicit and explicit recommendations
- evaluates recommender systems and compares these with related services

**Workload:**

The total workload for this course is approximately 135 hours (4.5 credits):

Time of attendance

- Attending the lecture: 15 x 90min = 22h 30m
- Attending the exercise classes: 7 x 90min = 10h 30m
- Examination: 1h 00m

Self-study

- Preparation and wrap-up of the lecture: 15 x 180min = 45h 00m
- Preparing the exercises: 25h 00m
- Preparation of the examination: 31h 00m

**Sum: 135h 00m**

**Exam:**

Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.

The course is considered successfully taken, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 10) from exercise work will be added.

**Grade: Minimum points**

- 1,0: 95
- 1,3: 90
- 1,7: 85
- 2,0: 80
- 2,3: 75
- 2,7: 70
- 3,0: 65
- 3,3: 60
- 3,7: 55
- 4,0: 50
- 5,0: 0

**Literature**

Rakesh Agrawal, Tomasz Imielinski, and Arun Swami. Mining association rules between sets of items in large databases. In Sushil Jajodia Peter Buneman, editor, Proceedings of the ACM SIGMOD International Conference on Management of Data, volume 22, Washington, D.C., USA, Jun 1993. ACM, ACM Press.

Rakesh Agrawal and Ramakrishnan Srikant. Fast algorithms for mining association rules. In Proceedings of the 20th Very Large Databases Conference, Santiago, Chile, pages 487 – 499, Sep 1994.

Asim Ansari, Skander Essegaier, and Rajeev Kohli. Internet recommendation systems. *Journal of Marketing Research*, 37:363 – 375, Aug 2000.

Christopher Avery, Paul Resnick, and Richard Zweckhauser. The market for evaluations. *American Economic Review*, 89(3):564 – 584, 1999.

Ibrahim Cingil, Asuman Dogac, and Ayca Azgin. A Broader Approach to Personalization. *Communications of the ACM*, 43(8):136 – 141, Aug 2000.

Richard O. Duda, Peter E. Hart, and David G. Stork. *Pattern Classification*. Wiley-Interscience, New York, 2 edition, 2001.

Andreas Geyer-Schulz, Michael Hahsler, and Maximilian Jahn. A customer purchase incidence model applied to recommender services. In R. Kohavi et al., editor, Proceedings of the WebKDD 2001 – Mining log data across all customer touchpoints, volume 2356 of Lecture Notes in Artificial Intelligence LNAI, pages 25–47, Berlin, 2002. ACM, Springer-Verlag.

Jon M. Kleinberg. Authoritative sources in a hyperlinked environment. *JACM*, 46(5):604–632, sep 1999.

Joseph Konstan, Bradley Miller, David Maltz, Jonathan Herlocker, Lee Gordon, and John Riedl. Grouplens: Applying Collaborative Filtering to Usenet News. *Communications of the ACM*, 40(3):77 – 87, Mar 1997.

Paul Resnick, Neophytos Iacovou, Peter Bergstrom, and John Riedl. Grouplens: An open architecture for collaborative filtering of netnews. In Proceedings of the conference on Computer supported cooperative work, pages 175 – 186. ACM Press, 1994.

**Weiterführende Literatur:**

Antoinette Alexander. The return of hardware: A necessary evil? *Accounting Technology*, 15(8):46 – 49, Sep 1999.

Christopher Avery and Richard Zeckhauser. Recommender systems for evaluating computer messages. *Communications of the ACM*, 40(3):88 – 89, Mar 1997.

Steven Bellman, Gerald Lohse, and Eric Johnson. Predictors of Online Buying Behavior. *Communications of the ACM*, 42(12):32 – 38, Dec 1999.

Thomas J. Blischok. Every transaction tells a story. *Chain Store Age Executive with Shopping Center Age*, 71(3):50–56, Mar 1995.

Hans Hermann Bock. *Automatische Klassifikation*. Vandenhoeck und Ruprecht, Göttingen, 1974.

Andrew S.C. Ehrenberg. *Repeat-Buying: Facts, Theory and Applications*. Charles Griffin & Company Ltd, London, 2 edition, 1988.

Wolfgang Gaul, Andreas Geyer-Schulz, Michael Hahsler, and Lars Schmidt-Thieme. eMarketing mittels Recommendersystemen. *Marketing ZFP*, 24:47 – 55, 2002.

Andreas Geyer-Schulz, Michael Hahsler, and Maximilian Jahn. myvu: a next generation recommender system based on observed consumer behavior and interactive evolutionary algorithms. In W. Gaul, O. Opitz, and M. Schader, editors, *Data Analysis – Scientific Modeling and Practical Applications*, volume 18 of Studies in Classification, Data Analysis and Knowledge Organization, pages 447 – 457, Heidelberg, Germany, 2000. Springer.

Andreas Geyer-Schulz, Michael Hahsler, and Maximilian Jahn. Educational and scientific recommender systems: Designing the information channels of the virtual university. *International Journal of Engineering Education*, 17(2):153 – 163, 2001.

Mark-Edward Grey. *Recommendersysteme auf Basis linearer Regression*, 2004.

John A. Hartigan. *Clustering Algorithms*. John Wiley and Sons, New York, 1975.

Kevin Kelly. *New Rules for the New Economy: 10 Radical Strategies for a Connected World*. Viking, 1998.

Taek-Hun Kim, Young-Suk Ryu, Seok-In Park, and Sung-Bong Yang. An improved recommendation algorithm in collaborative filtering. In K. Bauknecht, A. Min Tjoa, and G. Quirchmayr, editors, *E-Commerce and Web Technologies, Third International Conference, Aix-en-Provence, France*, volume 2455 of Lecture Notes in Computer Science, pages 254–261, Berlin, Sep 2002. Springer-Verlag.

Ron Kohavi, Brij Masand, Myra Spiliopoulou, and Jaideep Srivastava. Web mining. *Data Mining and Knowledge Discovery*, 6:5 – 8, 2002.

G. S. Maddala. *Introduction to Econometrics*. John Wiley, Chichester, 3 edition, 2001.

Andreas Mild and Martin Natter. Collaborative filtering or regression models for Internet recommendation systems? *Journal of Targeting, Measurement and Analysis for Marketing*, 10(4):304 – 313, Jan 2002.

Andreas Mild and Thomas Reutterer. An improved collaborative filtering approach for predicting cross-category purchases based on binary market basket data. *Journal of Retailing & Consumer Services*, 10(3):123–133, may 2003.

Paul Resnick and Hal R. Varian. Recommender Systems. *Communications of the ACM*, 40(3):56 – 58, Mar 1997.

Badrul M. Sarwar, Joseph A. Konstan, Al Borchers, Jon Herlocker, Brad Miller, and John Riedl. Using filtering agents to improve prediction quality in the grouplens research collaborative filtering system. In Proceedings of ACM Conference on Computer-Supported Cooperative Work, Social Filtering, Social Influences, pages 345 – 354, New York, 1998. ACM Press.

J. Ben Schafer, Joseph Konstan, and Jon Riedl. Recommender Systems in E-commerce. In Proceedings of the 1st ACM conference on Electronic commerce, pages 158 – 166, Denver, Colorado, USA, Nov 1999. ACM.

Upendra Shardanand and Patti Maes. Social information filtering: Algorithms for automating "word of mouth". In Proceedings of ACM SIGCHI, volume 1 of Papers: Using the Information of Others, pages 210 – 217. ACM, 1995.

T

**6.244 Course: Regulation Theory and Practice [T-WIWI-102712]**

**Responsible:** Prof. Dr. Kay Mitusch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101406 - Network Economics](#)  
[M-WIWI-101451 - Energy Economics and Energy Markets](#)

Type	Credits	Recurrence	Version
Oral examination	4,5	see Annotations	2

**Competence Certificate**

The lecture is not offered for an indefinite period of time.

Result of success is made by a 20-30 minutes oral examination. Examination is offered every semester and can be retried at any regular examination date.

**Prerequisites**

None

**Recommendation**

Basic knowledge and skills of microeconomics from undergraduate studies (bachelor's degree) are expected.

Particularly helpful but not necessary: Industrial Economics and Principal-Agent- or Contract theories. Prior attendance of the lecture *Competition in Networks* [26240] is helpful in any case but not considered a formal precondition.

**Annotation**

The lecture is not offered for an indefinite period of time.

T

**6.245 Course: Requirements Engineering [T-INFO-101300]**

**Responsible:** Prof. Dr.-Ing. Anne Kozirolek  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101201 - Software Systems](#)  
[M-INFO-101202 - Software Methods](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	2

Events					
SS 2020	2400050	<a href="#">Requirements Engineering</a>	2 SWS	Lecture (V)	Kozirolek
Exams					
SS 2020	7500059	<a href="#">Requirements Engineering</a>		Prüfung (PR)	Kozirolek
SS 2020	7500295	<a href="#">Requirements Engineering Second Exam VL 2400050</a>		Prüfung (PR)	Kozirolek

**Recommendation**

Das Modul Softwaretechnik II wird empfohlen.

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

V

**Requirements Engineering**

2400050, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

General remarks: The lecture is held in English and all lecture material is in English. The lecture will be recorded and the recordings will be made available on the Ilias platform.

**Literature**

Die Vorlesung basiert auf Folien und Arbeiten von Martin Glinz, daher ist kein direkt begleitendes Buch verfügbar. Abweichungen zwischen in der Vorlesung besprochenen Inhalten und von den Teilnehmern gelesenen Quellen dürfen gern im Kurs diskutiert werden.

Hauptinweis: Pohl, K. (2007). Requirements Engineering: Grundlagen, Prinzipien, Techniken. dpunkt. verlag. (in Bibliothek verfügbar)

Weitere Literaturhinweise

- I. Alexander, R. Stevens (2002). Writing Better Requirements. London: Addison-Wesley.
- A. Davis (2005). Just Enough Requirements Management. New York: Dorset House.
- D.C. Gause, G.M. Weinberg (1989). Exploring Requirements: Quality before Design. New York: Dorset House.
- M. Glinz (2013). A Glossary of Requirements Engineering Terminology, Version 1.5. International Requirements Engineering Board (IREB). Originally published in 2011. Available at <http://www.ireb.org> (check-out CPRE Glossary)
- E. Gottesdiener (2002). Requirements by Collaboration: Workshops for Defining Needs. Boston: Addison-Wesley.
- M.A. Jackson (1995). Software Requirements and Specifications: A Lexicon of Practice, Principles and Prejudices. Addison-Wesley (ACM Press books): Wokingham, etc.
- A. van Lamsweerde (2009). Requirements Engineering: From System Goals to UML Models to Software Specifications. Chichester: John Wiley & Sons.
- S. Robertson, J. Robertson (2006). Mastering the Requirements Process. 2nd edition. Boston: Addison-Wesley.
- K. Wiegers (2006). More About Software Requirements: Thorny Issues and Practical Advice. Redmond: Microsoft Press.

## T

**6.246 Course: Risk Management in Industrial Supply Networks [T-WIWI-102826]**

**Responsible:** Prof. Dr. Frank Schultmann  
Dr. Marcus Wiens

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

**Part of:** M-WIWI-101412 - Industrial Production III  
M-WIWI-101471 - Industrial Production II

Type	Credits	Recurrence	Version
Written examination	3,5	Each winter term	1

Events					
WS 19/20	2581992	Risk Management in Industrial Supply Networks	2 SWS	Lecture (V)	Wiens
WS 19/20	2581993	Übung zu Risk Management in Industrial Supply Networks	1 SWS	Practice (Ü)	Klein, Wiens
Exams					
WS 19/20	7981992	Risk Management in Industrial Supply Networks		Prüfung (PR)	Schultmann

**Competence Certificate**

The assessment consists of an oral (30 minutes) or a written (60 minutes) exam (following § 4(2), 1 of the examination regulation). The exam takes place in every semester. Reexaminations are offered at every ordinary examination date.

**Prerequisites**

None

**Recommendation**

None

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

## V

**Risk Management in Industrial Supply Networks**

2581992, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

Students learn methods and tools to manage risks in complex and dynamically evolving supply chain networks. Students learn the key terms and concepts of risk management and decision theory, in particular expected utility theory. Based on the theoretic prerequisites, students are able to determine and analyze risk diversification, risk pooling, insurance mechanisms and get an overview on statistical risk measures and real options. These approaches are adapted to analyze supply chain risks in a network context. In this manner, students gain knowledge in basic notions of network theory, network metrics and network-strategies for supply chain decisions.

- Introduction
- Risks in decisions under uncertainty: Expected Utility Theory & risk preferences
- The newsvendor model; multivariate risks and insurance
- Risk measures & evaluation techniques: Value-at-Risk, Conditional Value at Risk, Monte Carlo and Real Options
- Transparency in complex supply chains
- Network risk: network basics and criticality
- Risk in supply networks: empirical approaches and insights

**Literature**

Wird in der Veranstaltung bekannt gegeben.

T

**6.247 Course: Roadmapping [T-WIWI-102853]**

**Responsible:** Dr. Daniel Jeffrey Koch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101507 - Innovation Management](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each summer term	1

Events					
SS 2020	2545102	<a href="#">Technology Assessment</a>	2 SWS	Seminar (S)	Koch

**Competence Certificate**

Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO).

**Prerequisites**

None

**Recommendation**

Prior attendance of the course Innovation Management is recommended.

**Annotation**

See German version.

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

V

**Technology Assessment**

2545102, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)****Content**

Technology Assessment can play a role at different points in the innovation process and can be considered as decision support for or against certain technological options. The seminar Technology Assessment will focus on the early phase "fuzzy front end" in innovation management. The technology assessment will take place here under a high degree of uncertainty regarding future technological developments. The evaluation of technologies can be done with methods such as Technology Readiness, Technology Lifecycle Analysis, Portfolio Analysis, etc.. The early evaluation of technologies is particularly important against the background of limited resources in companies and uncertainty about future developments.



T

**6.248 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	Recurrence	Version
Written examination	6	Each winter term	1

Events					
WS 19/20	2424152	<a href="#">Robotics I - Introduction to Robotics</a>	3/1 SWS	Lecture (V)	Asfour, Paus
Exams					
WS 19/20	7500106	<a href="#">Robotics I - Introduction to Robotics</a>		Prüfung (PR)	Asfour
SS 2020	7500218	<a href="#">Robotik I - Einführung in die Robotik</a>		Prüfung (PR)	Asfour

T

**6.249 Course: Robotics II: Humanoid Robotics [T-INFO-105723]**

**Responsible:** Prof. Dr.-Ing. Tamim Asfour  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101251 - Autonomous Robotics](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	4

Events					
SS 2020	2400074	<a href="#">Robotics II: Humanoid Robotics</a>	2 SWS	Lecture (V)	Asfour
Exams					
WS 19/20	7500211	<a href="#">Robotics II: Humanoid Robotics</a>		Prüfung (PR)	Asfour
SS 2020	7500086	<a href="#">Robotics II: Humanoid Robotics</a>		Prüfung (PR)	Asfour

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

V

**Robotics II: Humanoid Robotics**

2400074, SS 2020, 2 SWS, Language: German/English, [Open in study portal](#)

**Lecture (V)****Content**

The lecture presents current work in the field of humanoid robotics that deals with the implementation of complex sensorimotor and cognitive abilities. In the individual topics different methods and algorithms, their advantages and disadvantages, as well as the current state of research are discussed.

The topics addressed are: biomechanical models of the human body, biologically inspired and data-driven methods of grasping, active perception, imitation learning and programming by demonstration as well as semantic representations of sensorimotor experience

**Learning Objectives:**

The students have an overview of current research topics in autonomous learning robot systems using the example of humanoid robotics. They are able to classify and evaluate current developments in the field of cognitive humanoid robotics.

The students know the essential problems of humanoid robotics and are able to develop solutions on the basis of existing research.

**Literature****Weiterführende Literatur**

Wissenschaftliche Veröffentlichungen zum Thema, werden auf der VL-Website bereitgestellt.

## T

## 6.250 Course: Robotics III - Sensors and Perception in Robotics [T-INFO-109931]

**Responsible:** Prof. Dr.-Ing. Tamim Asfour  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101251 - Autonomous Robotics](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	2

Events					
SS 2020	2400067	<a href="#">Robotics III - Sensors and Perception in Robotics</a>	2 SWS	Lecture (V)	Asfour, Grotz
Exams					
WS 19/20	7500207	<a href="#">Robotics III - Sensors and Perception in Robotics</a>		Prüfung (PR)	Asfour
SS 2020	7500242	<a href="#">Robotics III - Sensors and Perception in Robotics</a>		Prüfung (PR)	Asfour

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

## V

## Robotics III - Sensors and Perception in Robotics

2400067, SS 2020, 2 SWS, Language: German/English, [Open in study portal](#)

Lecture (V)

**Content**

The lecture supplements the lecture Robotics I with a broad overview of sensors used in robotics. The lecture focuses on visual perception, object recognition, simultaneous localization and mapping (SLAM) and semantic scene interpretation. The lecture is divided into two parts:

In the first part a comprehensive overview of current sensor technologies is given. A basic distinction is made between sensors for the perception of the environment (exteroceptive) and sensors for the perception of the internal state (proprioceptive).

The second part of the lecture concentrates on the use of exteroceptive sensors in robotics. The topics covered include tactile exploration and visual data processing, including advanced topics such as feature extraction, object localization, simultaneous localization and mapping (SLAM) and semantic scene interpretation.

**Learning Objectives:**

Students know the main sensor principles used in robotics and understand the data flow from physical measurement through digitization to the use of the recorded data for feature extraction, state estimation and environmental modeling.

Students are able to propose and justify suitable sensor concepts for common tasks in robotics.

**Literature**

Eine Foliensammlung wird im Laufe der Vorlesung angeboten.

Begleitende Literatur wird zu den einzelnen Themen in der Vorlesung bekannt gegeben.

T

**6.251 Course: Security [T-INFO-101371]**

**Responsible:** Prof. Dr. Dennis Hofheinz  
 Prof. Dr. Jörn Müller-Quade

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101207 - Networking Security - Theory and Praxis](#)

Type	Credits	Recurrence	Version
Written examination	6	Each summer term	1

Events					
SS 2020	24941	<a href="#">Security</a>	3 SWS	Lecture (V)	Müller-Quade, Strufe

T

**6.252 Course: Selected Issues in Critical Information Infrastructures [T-WIWI-109251]**

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-104403 - Critical Digital Infrastructures](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	2

Events					
SS 2020	2512403	<a href="#">Praktikum Blockchain und Distributed Ledger Technology (Master)</a>	SWS	Practical course (P)	Sunyaev, Beyene, Kannengießer, Pandl
Exams					
SS 2020	7900172	<a href="#">Lab Blockchain and Distributed Ledger Technology (Master)</a>		Prüfung (PR)	Sunyaev

**Competence Certificate**

Alternative exam assessment (§ 4(2), 3 SPO). Details will be announced in the respective course.

**Prerequisites**

None.

**Annotation**

T-WIWI-109251 "Selected Issues in Critical Information Infrastructures" serves to credit an extracurricular course in the module "Critical Digital Infrastructures".

T

**6.253 Course: Selected Legal Issues of Internet Law [T-INFO-108462]**

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101215 - Intellectual Property Law](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each summer term	1

Events					
SS 2020	24821	<a href="#">Selected legal issues of Internet law</a>	2 SWS	Colloquium (KOL)	Dreier
Exams					
SS 2020	7500226	<a href="#">Selected legal issues of Internet law</a>		Prüfung (PR)	Dreier

T

**6.254 Course: Selected Topics in Cryptography [T-INFO-101373]**

**Responsible:** Prof. Dr. Jörn Müller-Quade  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101198 - Advanced Topics in Cryptography](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each summer term	1

Exams				
WS 19/20	7500222	<a href="#">Selected Topics in Cryptography</a>	Prüfung (PR)	Geiselman, Müller-Quade, Hofheinz

T

**6.255 Course: Selling IT-Solutions Professionally [T-INFO-101977]**

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101208 - Innovative Concepts of Data and Information Management](#)

Type	Credits	Recurrence	Version
Completed coursework	1,5	Irregular	1



T

**6.256 Course: Semantic Web Technologies [T-WIWI-110848]**

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101455 - Web Data Management](#)  
[M-WIWI-105366 - Artificial Intelligence](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2511310	<a href="#">Semantic Web Technologies</a>	2 SWS	Lecture (V)	Sure-Vetter, Acosta Deibe, Käfer
SS 2020	2511311	<a href="#">Exercises to Semantic Web Technologies</a>	1 SWS	Practice (Ü)	Sure-Vetter, Acosta Deibe, Käfer
Exams					
SS 2020	7900028	<a href="#">Semantic Web Technologies (Registration until 13 July 2020)</a>		Prüfung (PR)	Sure-Vetter

**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 2020, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Content**

The aim of the Semantic Web is to make the meaning (semantics) of data on the web usable in intelligent systems, e.g. in e-commerce and internet portals

Central concepts are the representation of knowledge in form of RDF and ontologies, the access via Linked Data, as well as querying the data by using SPARQL. This lecture provides the foundations of knowledge representation and processing for the corresponding technologies and presents example applications.

The following topics are covered:

- Resource Description Framework (RDF) and RDF Schema (RDFS)
- Web Architecture and Linked Data
- Web Ontology Language (OWL)
- Query language SPARQL
- Rule languages
- Applications

**Learning objectives:**

The student

- understands the motivation and foundational ideas behind Semantic Web and Linked Data technologies, and is able to analyse and realise systems
- demonstrates basic competency in the areas of data and system integration on the web
- masters advanced knowledge representation scenarios involving ontologies

**Recommendations:**

Lectures on Informatics of the Bachelor on Information Systems (Semester 1-4) or equivalent are required. Knowledge of modeling with UML is required.

**Workload:**

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

**Literature**

- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, York Sure: *Semantic Web – Grundlagen*. Springer, 2008.
- John Domingue, Dieter Fensel, James A. Hendler (Editors). *Handbook of Semantic Web Technologies*. Springer, 2011.

**Weitere Literatur**

- S. Staab, R. Studer (Editors). *Handbook on Ontologies*. International Handbooks in Information Systems. Springer, 2003.
- Tim Berners-Lee. *Weaving the Web*. Harper, 1999 geb. 2000 Taschenbuch.
- Ian Jacobs, Norman Walsh. *Architecture of the World Wide Web, Volume One*. W3C Recommendation 15 December 2004. <http://www.w3.org/TR/webarch/>
- Dean Allemang. *Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL*. Morgan Kaufmann, 2008.
- Tom Heath and Chris Bizer. *Linked Data: Evolving the Web into a Global Data Space*. Synthesis Lectures on the Semantic Web: Theory and Technology, 2011.

**Exercises to Semantic Web Technologies**

2511311, SS 2020, 1 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

**Content**

The exercises are related to the lecture Semantic Web Technologies.

Multiple exercises are held that capture the topics, held in the lecture Semantic Web Technologies, and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

The following topics are covered:

- Resource Description Framework (RDF) and RDF Schema (RDFS)
- Web Architecture and Linked Data
- Web Ontology Language (OWL)
- Query language SPARQL
- Rule languages
- Applications

**Learning objectives:**

The student

- understands the motivation and foundational ideas behind Semantic Web and Linked Data technologies, and is able to analyse and realise systems
- demonstrates basic competency in the areas of data and system integration on the web
- masters advanced knowledge representation scenarios involving ontologies

**Recommendations:**

Lectures on Informatics of the Bachelor on Information Systems (Semester 1-4) or equivalent are required. Knowledge of modeling with UML is required.

**Literature**

- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, York Sure: Semantic Web – Grundlagen. Springer, 2008.
- John Domingue, Dieter Fensel, James A. Hendler (Editors). Handbook of Semantic Web Technologies. Springer, 2011.

**Weitere Literatur**

- S. Staab, R. Studer (Editors). Handbook on Ontologies. International Handbooks in Information Systems. Springer, 2003.
- Tim Berners-Lee. Weaving the Web. Harper, 1999 geb. 2000 Taschenbuch.
- Ian Jacobs, Norman Walsh. Architecture of the World Wide Web, Volume One. W3C Recommendation 15 December 2004. <http://www.w3.org/TR/webarch/>
- Dean Allemang. Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL. Morgan Kaufmann, 2008.
- Tom Heath and Chris Bizer. Linked Data: Evolving the Web into a Global Data Space. Synthesis Lectures on the Semantic Web: Theory and Technology, 2011.

T

## 6.257 Course: Seminar in Business Administration A (Master) [T-WIWI-103474]

**Responsible:** Professorenschaft des Fachbereichs Betriebswirtschaftslehre

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

**Part of:** M-WIWI-102736 - Seminar Module Economic Sciences

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Events					
WS 19/20	2500006	Seminar Human Resource Management (Master)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
WS 19/20	2500007	Seminar Human Resources and Organizations (Master)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
WS 19/20	2500029	Seminar in Data Science for Finance	2 SWS	Seminar (S)	Ulrich
WS 19/20	2530293		2 SWS	Seminar (S)	Ruckes, Hoang, Benz, Strych, Luedecke, Silbereis, Stengel, Schubert
WS 19/20	2540473	Data Science in Service Management	2 SWS	Seminar (S)	Haubner, Frankenhauser, Gröschel
WS 19/20	2540475	Electronic Markets & User behavior	2 SWS	Seminar (S)	Dorner, Knierim, Dann, Jaquart
WS 19/20	2540477	Digital Experience and Participation	2 SWS	Seminar (S)	Straub, Peukert, Hoffmann, Kloker, Pasmaz, Willrich, Kloepper, Fegert, Greif-Winzrieth
WS 19/20	2540478	Smart Grids and Energy Markets	2 SWS	Seminar (S)	Dinther, Staudt, Richter, Huber, vom Scheidt, Golla, Schmidt
WS 19/20	2540510	Masterseminar in Data Science and Machine Learning	2 SWS	Seminar (S)	Geyer-Schulz, Schweigert, Schweizer, Nazemi
WS 19/20	2540557	Literature Review Seminar: Information Systems and Service Design	3 SWS	Seminar (S)	Mädche
WS 19/20	2540559	Digital Service Design Seminar	2 SWS	Seminar (S)	Mädche
WS 19/20	2545107	Methoden im Innovationsmanagement	2 SWS	Seminar (S)	Koch
WS 19/20	2572181		2 SWS	Seminar (S)	Klarmann
WS 19/20	2577915	Strategische Unternehmensführung	2 SWS	Seminar (S)	Klopfer
WS 19/20	2579919	Seminar Management Accounting - Special Topics	2 SWS	Seminar (S)	Riar
WS 19/20	2581976	Seminar in Production and Operations Management I	2 SWS	Seminar (S)	Glöser-Chahoud, Schultmann
WS 19/20	2581977	Seminar in Production and Operations Management II	2 SWS	Seminar (S)	Volk, Schultmann
WS 19/20	2581978	Seminar in Production and Operations Management III	2 SWS	Seminar (S)	Wiens, Schultmann
WS 19/20	2581980		2 SWS	Seminar (S)	Keles, Fett, Yilmaz
WS 19/20	2581981		2 SWS	Seminar (S)	Ardone, Ruppert, Sandmeier, Slednev

WS 19/20	2581990		2 SWS	Seminar (S)	Schultmann, Schumacher
SS 2020	2400121	Interactive Analytics Seminar	2 SWS		Beigl, Madche, Pescara
SS 2020	2500006	Seminar Human Resource Management (Master)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
SS 2020	2500007	Seminar Human Resources and Organizations (Master)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
SS 2020	2530372	Advances in Financial Machine Learning	2 SWS	Seminar (S)	Ulrich
SS 2020	2530580	Seminar in Finance	2 SWS	Seminar (S)	Uhrig-Homburg, Eska, Schuster, Eberbach, Reichenbacher
SS 2020	2540510	Masterseminar in Data Science and Machine Learning	2 SWS	Seminar (S)	Geyer-Schulz
SS 2020	2540559	Digital Service Design Seminar	3 SWS	Seminar (S)	Madche, Feine
SS 2020	2545002	Entrepreneurship Research	2 SWS	Seminar (S)	Terzidis, Henn
SS 2020	2550493	Hospital Management	2 SWS	Block (B)	Hansis
SS 2020	2571180	Seminar in Marketing und Vertrieb (Bachelor)	2 SWS	Seminar (S)	Klarmann, Mitarbeiter, Feurer
SS 2020	2571181	Seminar in Marketing und Vertrieb (Master)	2 SWS	Seminar (S)	Klarmann, Mitarbeiter, Feurer
SS 2020	2579909	Seminar Management Accounting	2 SWS	Seminar (S)	Wouters, Hammann, Disch
SS 2020	2579919	Seminar in Management Accounting - Special Topics	2 SWS	Seminar (S)	Wouters, Ebinger
SS 2020	2581977	Seminar Produktionswirtschaft und Logistik II	2 SWS	Seminar (S)	Volk, Schultmann
SS 2020	2581980	Seminar Energiewirtschaft II	2 SWS	Seminar (S)	Keles
SS 2020	2581990		2 SWS	Seminar (S)	Schultmann, Schumacher, Baumgartner
<b>Exams</b>					
WS 19/20	7900017	Seminar Smart Grid and Energy Markets		Prufung (PR)	Weinhardt
WS 19/20	7900106	Hospital Management		Prufung (PR)	Nickel
WS 19/20	7900133	Digital Service Design Seminar		Prufung (PR)	Madche
WS 19/20	7900141	Innovation Processes Live		Prufung (PR)	Weissenberger-Eibl
WS 19/20	7900143	Methods in Innovation Management		Prufung (PR)	Weissenberger-Eibl
WS 19/20	7900151	Master Seminar in Data Science and Machine Learning		Prufung (PR)	Geyer-Schulz
WS 19/20	7900159	Seminar in Marketing and Sales		Prufung (PR)	Klarmann
WS 19/20	7900163	Seminar Human Resource Management (Master)		Prufung (PR)	Nieken
WS 19/20	7900164	Seminar Human Resources and Organizations (Master)		Prufung (PR)	Nieken
WS 19/20	7900165	Seminar Digital Experience and Participation		Prufung (PR)	Weinhardt
WS 19/20	7900184	Seminar in Finance (Master)		Prufung (PR)	Ruckes
WS 19/20	7900203	Seminar in Finance		Prufung (PR)	Uhrig-Homburg
WS 19/20	7900222	Seminar Strategic Management (Master)		Prufung (PR)	Lindstadt
WS 19/20	7900233	Literature Review Seminar: Information Systems and Service Design (Seminar)		Prufung (PR)	Madche
WS 19/20	7900237	Case Studies Seminar: Innovation Management		Prufung (PR)	Weissenberger-Eibl
WS 19/20	7900239	Technologies for Innovation Management		Prufung (PR)	Weissenberger-Eibl
WS 19/20	7900312	Seminar Business Data Analytics (Master)		Prufung (PR)	Weinhardt
WS 19/20	7900324	Seminar in Business Administration A (Master)		Prufung (PR)	Ulrich

WS 19/20	7900327	Electronic Markets & User behavior (Seminar)	Prüfung (PR)	Weinhardt
WS 19/20	79-2579919-M	Seminar Management Accounting - Special Topics (Master)	Prüfung (PR)	Wouters
WS 19/20	7981976	Seminar in Production and Operations Management I	Prüfung (PR)	Schultmann
WS 19/20	7981977	Seminar in Production and Operations Management II	Prüfung (PR)	Schultmann
WS 19/20	7981978	Seminar in Production and Operations Management III	Prüfung (PR)	Schultmann
WS 19/20	7981979	Seminar in Business Administration A (Master)	Prüfung (PR)	Fichtner
WS 19/20	7981980	Seminar in Business Administration A (Master)	Prüfung (PR)	Fichtner
WS 19/20	7981981	Seminar in Business Administration (Bachelor)	Prüfung (PR)	Fichtner
SS 2020	7900017	Die Aushandlung von Open Innovation	Prüfung (PR)	Weissenberger-Eibl
SS 2020	7900052	Entrepreneurship Research	Prüfung (PR)	Terzidis
SS 2020	7900093	Seminar in Business Administration A	Prüfung (PR)	Weinhardt
SS 2020	7900219	Seminar in Business Administration A (Master)	Prüfung (PR)	Ulrich
SS 2020	7900238	Technology Assessment	Prüfung (PR)	Weissenberger-Eibl
SS 2020	7900242	Applied Risk and Asset Management	Prüfung (PR)	Ulrich
SS 2020	7900284	Digital Transformation and Business Models	Prüfung (PR)	Weissenberger-Eibl
SS 2020	7981976	Seminar in Production and Operations Management I	Prüfung (PR)	Schultmann
SS 2020	7981977	Seminar in Production and Operations Management II	Prüfung (PR)	Schultmann
SS 2020	7981978	Seminar in Production and Operations Management III	Prüfung (PR)	Schultmann
SS 2020	7981980	Seminar Energy Economics II	Prüfung (PR)	Fichtner
SS 2020	7981981	Seminar Energy Economics III	Prüfung (PR)	Fichtner

### 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:

	<b>Seminar Human Resource Management (Master)</b> 2500006, WS 19/20, 2 SWS, Language: German, <a href="#">Open in study portal</a>	<b>Seminar (S)</b>
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**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.

**Seminar Human Resources and Organizations (Master)**

2500007, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**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.

**Seminar in Data Science for Finance**

2500029, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**Content**

The aim of this seminar is to master real-world challenges of computational risk and asset management. The CRAM team offers a wide range of topics across different asset classes and different stages of the investment process.

Students will work on a quantitative problem related to risk and asset management. This seminar is ideally suited for students who want to deepen and apply their statistics / programming skills and knowledge about financial markets. Industry-relevant problems will be solved with financial data and modern statistical tools in close collaboration with a supervisor. Topics which students solved in the past include the option-based pricing of dividends during the Euro crisis, the estimation of risk neutral moments with high-frequency data and the application of a particle filter to estimate stochastic volatility. The current topics will be presented during the first meeting.

**Data Science in Service Management**2540473, WS 19/20, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

**Content**

wird auf deutsch und englisch gehalten

**Masterseminar in Data Science and Machine Learning**2540510, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Digital Service Design Seminar**2540559, WS 19/20, 2 SWS, [Open in study portal](#)

Seminar (S)

**Methoden im Innovationsmanagement**2545107, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

The seminar "Methods in Innovation Management" aims at the discussion and development of different methods for the structured generation of ideas in selected contexts. In a block seminar, methods and contexts are discussed, from which seminar topics are defined with the participants. These topics are to be worked on independently using methods and procedures. The results will be presented at a presentation date and then a written seminar paper will be prepared. This means that creativity methods and their combination will be presented and applied. The methods are worked on in a structured form and process-like sequence in order to clarify the advantages and disadvantages of different methods.

**Literature**

Werden in der ersten Veranstaltung bekannt gegeben.

2572181, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

The seminary teaches students to gain a systematic overview of a field of literature in Marketing - an important prerequisite for a successful master thesis. Central aspects are identification of relevant literature sources, systematization of the field, working out central insights, writing comprehensively, and identification of research gaps.

**Students**

- can exploit a literature field systematically
- are able to write an academic paper in a formally correct way
- can assess the relevance and quality of sources
- are able to get an overview of sources very quickly
- know how to find relevant sources for a literature field
- are capable to write a convincing outline
- know how to categorize a subject under a research field
- understand how to systematize literature fields theoretically and empirically with the help of literature tables
- can identify the most important findings in a huge number of sources
- are able to present a research field
- can discuss the theoretical and practical implications of a topic
- are capable to identify interesting research gaps

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

Students interested in master thesis positions at the chair of marketing should participate in the marketing seminar. For further information please contact Marketing & Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu))

**Literature**

werden im Seminar bekannt gegeben./will be announced in the seminary.



**Seminar Management Accounting - Special Topics**2579919, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**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.

**Required prior Courses:**

- The LV "Betriebswirtschaftslehre: Finanzwirtschaft und Rechnungswesen" (2600026) must have been completed before starting this seminar.

**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.

**Interactive Analytics Seminar**2400121, SS 2020, 2 SWS, Language: English, [Open in study portal](#)**Content**

Providing new and innovative ways for interacting with data is becoming increasingly important. In this seminar, an interdisciplinary team of students engineers a running software prototype of an advanced interactive system leveraging state-of-the-art hardware and software focusing on an analytical use case. The seminar is carried out in cooperation between Teco/Chair of Pervasive Computing Systems (Prof. Beigl) and the Institute of Information Systems and Marketing (Research Group ISSD, Prof. Mädche). This seminar follows an interdisciplinary approach. Students the fields of computer science, information systems and industrial engineering work together in teams.

**Learning Objectives**

- Explore and specify a data-driven interaction challenge
- Suggest and evaluate different design solutions for addressing the identified problem
- Build interactive analytics prototypes using advanced interaction concepts and pervasive computing technologies

**Prerequisites**

Strong analytic abilities and profound skills in SQL as wells as Python and/or R are required.

**Literature**

Further literature will be made available in the seminar.

**Seminar Human Resource Management (Master)**2500006, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**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.

**Seminar Human Resources and Organizations (Master)**

2500007, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**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.

**Advances in Financial Machine Learning**

2530372, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**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 important computational risk and asset management problems. In particular we will use the state of the art Python programming language to implement investment related applications and/ or Finance 4.0 risk management solutions.

In a bi-weekly schedule you and your supervisor will first learn and discuss important machine learning concepts and then apply it within a practical FinTech project to real-world data. As a prerequisite students should already have some basic Python and data science skills.

**Literature**

Literatur wird in der ersten Vorlesung bekannt gegeben.

**Seminar in Finance**

2530580, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Literature**

Wird jeweils am Ende des vorherigen Semesters bekanntgegeben.

**Masterseminar in Data Science and Machine Learning**

2540510, SS 2020, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

**Digital Service Design Seminar**

2540559, SS 2020, 3 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**Content****Description**

In this seminar, a team of students addresses a real-world design challenge of an IISM cooperation partner. Students learn and apply design methods, techniques, and tools to explore the problem and deliver a solution in the form of an innovative prototype

**Learning objectives**

The students

- explore a real-world digital service design challenge
- understand the human-centered design process and apply selected design techniques & tools
- deliver a digital service prototype as a potential solution for the challenge

**Prerequisites**

No specific prerequisites are required for the seminar

**Literature**

Further literature will be made available in the seminar.

**Entrepreneurship Research**

2545002, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Literature**

Wird im Seminar bekannt gegeben.

**Hospital Management**

2550493, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Block (B)

**Content**

The seminar 'Hospital Management' presents internal organization structures, work conditions and work environments at the example of hospitals und relates this to common and expected conditions of other service industries.

Covered topics include normative environment, intra-organizational structure, personnel management, quality, external networking and market appearance. The course consists of two full-day sessions.

The assessment consists of attendance and a presentation or a case study.

**Seminar Management Accounting**

2579909, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**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.

**Required prior Courses:**

- The LV "Betriebswirtschaftslehre: Finanzwirtschaft und Rechnungswesen" (2600026) must have been completed before starting this seminar.

**Note:**

- Maximum of 16 students.

**Literature**

Will be announced in the course.

**Seminar in Management Accounting - Special Topics**

2579919, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)**

**Content**

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in several meetings that are spread throughout the semester.

**Learning objectives:**

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

**Workload:**

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

**Examination:**

- The performance review is carried out in the form of a "Prüfungsleistung anderer Art" (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade of the course is the grade awarded to the paper.

**Required prior Courses:**

- The LV "Betriebswirtschaftslehre: Finanzwirtschaft und Rechnungswesen" (2600026) must have been completed before starting this seminar.

**Note:**

- Maximum of 16 students.

**Literature**

Will be announced in the course.

T

**6.258 Course: Seminar in Economic Policy [T-WIWI-102789]**

**Responsible:** Prof. Dr. Ingrid Ott  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101514 - Innovation Economics](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Exams				
WS 19/20	7900103	<a href="#">Data-driven innovation and science communication (Master)</a>	Prüfung (PR)	Ott

**Competence Certificate**

The assessment is carried out through a term paper within the range of 12 to 15 pages, a presentation of the results of the work in a seminar meeting, and active participation in the discussions of the seminar meeting (§ 4 (2), 3 SPO).

The final grade is composed of the weighted scored examinations (Essay 50%, 40% oral presentation, active participation 10%).

**Prerequisites**

None

**Recommendation**

At least one of the lectures "Theory of Endogenous Growth" or "Innovation Theory and Policy" should be attended in advance, if possible.

T

**6.259 Course: Seminar in Economics A (Master) [T-WIWI-103478]****Responsible:** Professorenschaft des Fachbereichs Volkswirtschaftslehre**Organisation:** KIT Department of Economics and Management**Part of:** M-WIWI-102736 - Seminar Module Economic Sciences

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Events					
WS 19/20	2560140	Topics in Political Economy (Bachelor)	2 SWS	Seminar (S)	Ehrlich, Huber
WS 19/20	2560141	Morals & Social Behavior (Bachelor & Master)	2 SWS	Seminar (S)	Huber, Ehrlich
WS 19/20	2560142	Topics in Political Economy (Master)	2 SWS	Seminar (S)	Ehrlich, Huber
WS 19/20	2561208	Ausgewählte Aspekte der europäischen Verkehrsplanung und -modellierung	1 SWS	Seminar (S)	Szimba
SS 2020	2521310	Advanced Topics in Econometrics	2 SWS	Seminar (S)	Schienle, Krüger, Buse, Görden
SS 2020	2560282	Wirtschaftspolitisches Seminar	2 SWS	Seminar (S)	Ott, Assistenten
SS 2020	2560554	Fighting Climate Change, Seminar on Morals and Social Behavior (Bachelor)	2 SWS	Seminar (S)	Szech, Zhao
SS 2020	2560556	Designing the Digital Economy, Topics on Political Economy (Bachelor)	2 SWS	Seminar (S)	Szech, Huber
SS 2020	2560557	Designing the Digital Economy, Topics on Political Economy (Master)	2 SWS	Seminar (S)	Szech, Huber
Exams					
WS 19/20	7900103	Data-driven innovation and science communication (Master)		Prüfung (PR)	Ott
WS 19/20	7900132	Seminar in Economics A (Master)		Prüfung (PR)	Fuchs-Seliger
WS 19/20	7900139	Seminar in Economics (Bachelor/Master)		Prüfung (PR)	Mitusch
WS 19/20	7900140	Seminar in Economics A (Master)		Prüfung (PR)	Szech, Puppe
WS 19/20	7900186	Seminar Debt, Money and Markets: Economic Narrative and Anthropological Evidence		Prüfung (PR)	Puppe
WS 19/20	7900207	Seminar in Macroeconomics I		Prüfung (PR)	Scheffel
WS 19/20	7900221	Topics in Experimental Economics		Prüfung (PR)	Reiß
WS 19/20	7900259	Seminar in Macroeconomics II		Prüfung (PR)	Scheffel
WS 19/20	7900278	Seminar on Morals and Social Behavior		Prüfung (PR)	Szech, Puppe
WS 19/20	79sefi2	Seminar in Economics A (Master)		Prüfung (PR)	Wigger
SS 2020	7900081	Seminar in Macroeconomics I		Prüfung (PR)	Scheffel

**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:

**Topics in Political Economy (Bachelor)**2560140, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)****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 presentations in the seminar (50%) and the seminar paper (50%). Students can improve their grades by 0.3 for good and constructive discussion contributions or by 0.7 for excellent and constructive discussion contributions.

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.

**Morals & Social Behavior (Bachelor & Master)**2560141, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)****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 presentations in the seminar (50%) and the seminar paper (50%).

For Master students, grades will be based on the quality of presentations in the seminar (40%) and the seminar paper (40%). Additionally Master students will have to hand in two abstracts with their paper – one with a maximum length of 100 words and one with a maximum length of 150 words. The quality of abstracts will reflect with 20% in the final grade.

Students can improve their grades by 0.3 for good and constructive discussion contributions or by 0.7 for excellent and constructive discussion contributions.

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.

**Topics in Political Economy (Master)**2560142, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)**



**Content**

For Master students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Econometrics.

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 presentations in the seminar (40%) and the seminar paper (40%). Additionally students will have to hand in two abstracts with their paper – one with a maximum length of 100 words and one with a maximum length of 150 words. The quality of abstracts will reflect with 20% in the final grade. Students can improve their grades by 0.3 for good and constructive discussion contributions or by 0.7 for excellent and constructive discussion contributions.

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.

**Advanced Topics in Econometrics**

2521310, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**Fighting Climate Change, Seminar on Morals and Social Behavior (Bachelor)**

2560554, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**Content**

For Master students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Econometrics.

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 lengths (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.

**Designing the Digital Economy, Topics on Political Economy (Bachelor)**

2560556, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**Designing the Digital Economy, Topics on Political Economy (Master)**

2560557, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

## T

## 6.260 Course: Seminar in Informatics B (Master) [T-WIWI-103480]

**Responsible:** Professorenschaft des Fachbereichs Informatik

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

**Part of:** M-INFO-102822 - Seminar Module Informatics

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Events					
WS 19/20	2400125	Security and Privacy Awareness	2 SWS	Seminar (S)	Boehm, Seidel-Saul, Volkamer, Aldag, Gerber, Gottschalk
WS 19/20	2512301	Linked Data and the Semantic Web	3 SWS		Sure-Vetter, Acosta Deibe, Käfer, Heling
WS 19/20	2512311	Real-World Challenges in Data Science and Analytics	3 SWS		Sure-Vetter, Nickel, Weinhardt, Zehnder, Brandt
WS 19/20	2513500	Cognitive Automobiles and Robots	2 SWS	Seminar (S)	Zöllner
WS 19/20	2595470	Seminar Service Science, Management & Engineering	3 SWS	Seminar (S)	Weinhardt, Satzger, Nickel, Fromm, Fichtner, Sure-Vetter
SS 2020	2513211	Seminar Business Information Systems (Master)	2 SWS	Seminar (S)	Oberweis, Fritsch, Frister, Schreiber, Schüler, Ullrich
SS 2020	2513309	Seminar Knowledge Discovery and Data Mining (Master)	3 SWS	Seminar (S)	Sure-Vetter, Färber, Nguyen, Noullet, Saier
SS 2020	2513311	Seminar Data Science & Real-time Big Data Analytics (Master)	2 SWS	Seminar (S)	Sure-Vetter, Riemer, Zehnder
SS 2020	2513403	Emerging Trends in Internet Technologies (Master)	2 SWS	Seminar (S)	Lins, Sunyaev, Thiebes
SS 2020	2513405	Emerging Trends in Digital Health (Master)	2 SWS	Seminar (S)	Lins, Sunyaev, Thiebes
SS 2020	2513500	Cognitive Automobiles and Robots	2 SWS	Seminar (S)	Zöllner
SS 2020	2513553	Seminar E-Voting (Master)	2 SWS	Seminar (S)	Beckert, Müller-Quade, Volkamer, Dörre, Düzgün, Kirsten, Schwerdt
SS 2020	2513555	Seminar Security, Usability and Society (Master)	2 SWS	Seminar (S)	Volkamer, Aldag, Reinheimer
SS 2020	2595470	Seminar Service Science, Management & Engineering	2 SWS	Seminar (S)	Weinhardt, Nickel, Fichtner, Satzger, Sure-Vetter, Fromm
Exams					
WS 19/20	7500175	Seminar: Energy Informatics		Prüfung (PR)	Wagner
WS 19/20	7500220	Seminar Ubiquitous Computing		Prüfung (PR)	Beigl
WS 19/20	7900038	Linked Data and the Semantic Web		Prüfung (PR)	Sure-Vetter
WS 19/20	7900044	Seminar Service Science, Management & Engineering		Prüfung (PR)	Sure-Vetter
WS 19/20	7900119	Cognitive automobiles and robots		Prüfung (PR)	Zöllner
WS 19/20	7900129	Security and Privacy Awareness		Prüfung (PR)	Volkamer
WS 19/20	7900187	Real-World Challenges in Data Science und Analytics		Prüfung (PR)	Sure-Vetter
SS 2020	7900092	Seminar Service Science, Management & Engineering		Prüfung (PR)	Sure-Vetter

SS 2020	7900128	Emerging Trends in Internet Technologies (Master)	Prüfung (PR)	Sunyaev
SS 2020	7900146	Emerging Trends in Digital Health (Master)	Prüfung (PR)	Sunyaev
SS 2020	7900194	Seminar Mathematics	Prüfung (PR)	Volkamer
SS 2020	7900196	Seminar Business Information Systems (Master)	Prüfung (PR)	Oberweis
SS 2020	7900198	Seminar Data Science & Real-time Big Data Analytics (Master)	Prüfung (PR)	Sure-Vetter
SS 2020	7900200	Seminar E-Voting (Master)	Prüfung (PR)	Volkamer
SS 2020	7900202	Seminar Knowledge Discovery and Data Mining (Master)	Prüfung (PR)	Sure-Vetter
SS 2020	7900218	Seminar Security, Usability and Society (Master)	Prüfung (PR)	Volkamer

### Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

### Prerequisites

None.

### Recommendation

See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

### Annotation

Placeholder for seminars offered by the Institute AIFB.

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:



### Security and Privacy Awareness

2400125, WS 19/20, 2 SWS, [Open in study portal](#)

Seminar (S)

**Content**

Within the framework of this interdisciplinary seminar, the topics security awareness and privacy awareness are to be considered from different perspectives. It deals with legal, information technology, psychological, social as well as philosophical aspects.

Dates:

- Kick-Off (with topic placing): 25.10.19, 11:30-13:00 Building 5.20 Room 1C-01
- Final version: 10.03.20
- Presentation: 25.03.20

Topics will be assigned at the Kick-Off.

Topics:

- Mass surveillance of communication nodes and chilling effects - a legal and ethical debate (Supervisor: Prof. Seidel, Prof. Boehm, Gottschalk)
- Ethical analysis of so-called attack studies in the context of the survey of security awareness (Supervisor: Prof. Seidel, Prof. Volkamer)
- Privacy awareness in the context of Alexa and Co. (Supervisor: Prof. Boehm, Gottschalk, Prof. Volkamer, Aldag)
- Security awareness in the context of 2 factor authentication when paying with credit cards on the Internet (Supervisor: Prof. Volkamer, Aldag)
- What is the worth of privacy? (Supervisor: Prof. Seidel)
- Processing Social Media Content for Law Enforcement (Supervisor: Prof. Boehm, Gottschalk)

ATTENTION: The seminar is only for MASTER students!

**Linked Data and the Semantic Web**

2512301, WS 19/20, 3 SWS, Language: German/English, [Open in study portal](#)

**Content**

Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this practical seminar is to build applications and devise algorithms that consume, provide, or analyse Linked Data.

The Linked Data principles are a set of practices for data publishing on the web. Linked Data builds on the web architecture and uses HTTP for data access, and RDF for describing data, thus aiming towards web-scale data integration. There is a vast amount of data available published according to those principles: recently, 4.5 billion facts have been counted with information about various domains, including music, movies, geography, natural sciences. Linked Data is also used to make web-pages machine-understandable, corresponding annotations are considered by the big search engine providers. On a smaller scale, devices on the Internet of Things can also be accessed using Linked Data which makes the unified processing of device data and data from the web easy.

In this practical seminar, students will build prototypical applications and devise algorithms that consume, provide, or analyse Linked Data. Those applications and algorithms can also extend existing applications ranging from databases to mobile apps.

For the seminar, programming skills or knowledge about web development tools/technologies are highly recommended. Basic knowledge of RDF and SPARQL are also recommended, but may be acquired during the seminar. Students will work in groups. Seminar meetings will take place as 'Block-Seminar'.

Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media

The exact dates and information for registration will be announced at the event page.

**Real-World Challenges in Data Science and Analytics**

2512311, WS 19/20, 3 SWS, Language: German/English, [Open in study portal](#)

**Content**

In the seminar, various Real-World Challenges in Data Science and Analytics will be worked on.

During this seminar, groups of students work on a case challenge with data provided. Here, the typical process of a data science project is depicted: integration of data, analysis of these, modeling of the decisions and visualization of the results.

During the seminar, solution concepts are worked out, implemented as a software solution and presented in an intermediate and final presentation. The seminar "Real-World Challenges in Data Science and Analytics" is aimed at students in master's programs.

The exact dates and information for registration will be announced at the course page.

**Cognitive Automobiles and Robots**2513500, WS 19/20, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

**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.

**Seminar Service Science, Management & Engineering**2595470, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: [www.ksri.kit.edu](http://www.ksri.kit.edu)

The assessment of this course is according to §4(2), 3 SPO in form of an examination of the written seminar thesis (15-20 pages), a presentation and active participation in class.

The final mark is based on the examination of the written seminar thesis but can be upgraded or downgraded according to the quality of the presentation.

**Learning objectives:**

The student

- illustrates and evaluates classic and current research questions in service science, management and engineering,
- applies models and techniques in service science, also with regard to their applicability in practical cases,
- 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.

**Recommendations:**

Lecture *eServices* [2595466] is recommended.

**Workload:**

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

**Literature**

Die Basisliteratur wird entsprechend der zu bearbeitenden Themen bereitgestellt.

**Seminar Knowledge Discovery and Data Mining (Master)**2513309, SS 2020, 3 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**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.

**Literature**

Detaillierte Referenzen werden zusammen mit den jeweiligen Themen angegeben. Allgemeine Hintergrundinformationen ergeben sich z.B. aus den folgenden Lehrbüchern:

- Mitchell, T.; Machine Learning
- McGraw Hill, Cook, D.J. and Holder, L.B. (Editors) Mining Graph Data, ISBN:0-471-73190-0
- Wiley, Manning, C. and Schütze, H.; Foundations of Statistical NLP, MIT Press, 1999.

**Seminar Data Science & Real-time Big Data Analytics (Master)**

2513311, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**Content**

In this practical 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 practical seminar is given under the following Link:

<http://seminar-cep.fzi.de>

Questions are answered via the e-mail address [sem-ep@fzi.de](mailto:sem-ep@fzi.de).

**Cognitive Automobiles and Robots**

2513500, SS 2020, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

**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.

**Seminar E-Voting (Master)**

2513553, SS 2020, 2 SWS, [Open in study portal](#)

Seminar (S)

**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](https://secuso.aifb.kit.edu/Studium_und_Lehre.php).

**Seminar Security, Usability and Society (Master)**

2513555, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content****Seminar:**

The main topic of this seminar is security, usability, and society. The goal is to analyze these topics from different perspectives. Always important is the human, as we are interested in how humans interact with certain problems and how it might be possible to tackle it. For instance, phishing detection, how is it possible to ensure a higher detection. To tackle this problem, you can either focus on the technical side, awareness training, regulations by organizations.

**Further important information:**

Because of the current situation, every meeting will be held online. This might change during the semester, depending on the course of the corona situation.

**Important dates:**

- Kick-Off 22.04
- Final submission 01.07
- Presentation 14.07

**Topics:**

Will be announced on the 30.03

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](https://secuso.aifb.kit.edu/Studium_und_Lehre.php).

**Seminar Service Science, Management & Engineering**

2595470, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: [www.ksri.kit.edu](http://www.ksri.kit.edu)

**Learning objectives:**

The student

- illustrates and evaluates classic and current research questions in service science, management and engineering,
- applies models and techniques in service science, also with regard to their applicability in practical cases,
- 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.

**Recommendations:**

Lecture *eServices* [2595466] is recommended.

**Workload:**

The total workload for this course is approximately 90 hours.

**Literature**

Die Basisliteratur wird entsprechend der zu bearbeitenden Themen bereitgestellt.

**6.261 Course: Seminar in Operations Research A (Master) [T-WIWI-103481]**

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

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

**Part of:** [M-WIWI-102736 - Seminar Module Economic Sciences](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Events					
WS 19/20	2550473	<a href="#">Seminar on Power Systems Optimization (Master)</a>	2 SWS	Seminar (S)	Rebennack, Sinske
WS 19/20	2550491	<a href="#">Seminar: Modern OR and Innovative Logistics</a>	2 SWS	Seminar (S)	Nickel, Mitarbeiter
SS 2020	2550473	<a href="#">Seminar on Power Systems Optimization (Master)</a>	2 SWS	Seminar (S)	Rebennack
SS 2020	2550491	<a href="#">Seminar: Modern OR and Innovative Logistics</a>	2 SWS	Seminar (S)	Nickel, Mitarbeiter
Exams					
WS 19/20	7900012_WS1920	<a href="#">Seminar in Operations Research A (Master)</a>		Prüfung (PR)	Stein
WS 19/20	7900156	<a href="#">Modern OR and Innovative Logistics</a>		Prüfung (PR)	Nickel
WS 19/20	7900212	<a href="#">Real-World Challenges in Data Science und Analytics</a>		Prüfung (PR)	Nickel
WS 19/20	7900314	<a href="#">Seminar in Operations Research A (Master)</a>		Prüfung (PR)	Rebennack

**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:

**Seminar: Modern OR and Innovative Logistics**

2550491, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)



**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.

**Literature**

Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.

**Seminar: Modern OR and Innovative Logistics**

2550491, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**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.

**Literature**

Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.

T

**6.262 Course: Seminar in Statistics A (Master) [T-WIWI-103483]**

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

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

**Part of:** [M-WIWI-102736 - Seminar Module Economic Sciences](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Events					
SS 2020	2521310	<a href="#">Advanced Topics in Econometrics</a>	2 SWS	Seminar (S)	Schienle, Krüger, Buse, Görgen

**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

**Advanced Topics in Econometrics**

2521310, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**6.263 Course: Seminar Informatics A [T-INFO-104336]**

**Responsible:** Prof. Dr. Sebastian Abeck  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-102822 - Seminar Module Informatics](#)

Type	Credits	Version
Examination of another type	3	1

Events					
WS 19/20	2400078	<a href="#">Seminar: Neuronale Netze und künstliche Intelligenz</a>	SWS	Seminar (S)	Waibel, Stüker, Asfour, HA
WS 19/20	24844	<a href="#">Seminar: Ubiquitous Systems</a>	2 SWS	Seminar (S)	Beigl, Pescara
SS 2020	2400011	<a href="#">Hot Topics in Bioinformatics</a>	2 SWS	Seminar (S)	Stamatakis
SS 2020	24344	<a href="#">Advanced Methods of Information Fusion</a>	2 SWS	Seminar (S)	Hanebeck, Radtke
Exams					
WS 19/20	7500021	<a href="#">Advanced Methods of Information Fusion</a>		Prüfung (PR)	Hanebeck
WS 19/20	7500096	<a href="#">Seminar in Cryptography</a>		Prüfung (PR)	Geiselman, Müller-Quade, Hofheinz
WS 19/20	7500097	<a href="#">Seminar in Security</a>		Prüfung (PR)	Geiselman, Müller-Quade, Hofheinz
WS 19/20	7500122	<a href="#">Seminar: Internet of Things in Embedded Systems</a>		Prüfung (PR)	Henkel
WS 19/20	7500175	<a href="#">Seminar: Energy Informatics</a>		Prüfung (PR)	Wagner
WS 19/20	7500220	<a href="#">Seminar Ubiquitous Computing</a>		Prüfung (PR)	Beigl
WS 19/20	7500224	<a href="#">Seminar: Neural Networks and Artificial Intelligence</a>		Prüfung (PR)	Stüker
WS 19/20	7500257	<a href="#">Seminar Big Data Tools</a>		Prüfung (PR)	Streit
WS 19/20	7500267	<a href="#">Seminar Advanced Topics in Machine Translation</a>		Prüfung (PR)	Waibel
WS 19/20	7500328	<a href="#">Seminar: Non-Volatile Memory Architectures</a>		Prüfung (PR)	Henkel
SS 2020	7500013	<a href="#">Advanced Methods of Information Fusion</a>		Prüfung (PR)	Hanebeck, Noack
SS 2020	7500014	<a href="#">Seminar: Hot Topics in Bioinformatics</a>		Prüfung (PR)	Stamatakis
SS 2020	7500162	<a href="#">Seminar: Ubiquitous Systems</a>		Prüfung (PR)	Beigl, Riedel

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

**Seminar: Neuronale Netze und künstliche Intelligenz**

2400078, WS 19/20, SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

**Content**

In many tasks that appear natural to us, the fastest computers are unable to match the performance of the human brain. Neural networks attempt to simulate the parallel and distributed architecture of the brain in order to master these skills with learning algorithms. In this context, focus is being put on neural network approaches to computer vision and speech recognition, robotics and other areas.

In this seminar students will acquaint themselves with literature from provided topics and will present their results as a talk supported by slides to the other participants of the seminar.

**Recommendations:**

- Finishing the module "Kognitive Systeme" prior to the seminar is recommended.
- Attending the lecture "Deep Learning und Neuronale Netze" prior to the seminar is of advantage

**Hot Topics in Bioinformatics**2400011, SS 2020, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)****Content**

**Prerequisites:** CS Master's level seminar. Participants must have attended and passed the course on "Introduction to Bioinformatics for Computer Scientists" in one of the preceding winter terms.

**Task:** You will need to select papers to present, give a presentation and write a report.

This main seminar allows students to understand and present the contents of current papers in Bioinformatics such as published for instance in the journals *Bioinformatics*, *BMC Bioinformatics*, *Journal of Computational Biology* etc. or at conferences such as *ISMB* or *RECOMB*.

We will provide a list of interesting papers, but students can also propose papers they are interested in. Students may also choose to cover broader topics of more general interest such as multiple sequence alignment, Bayesian phylogenetic inference, read assembly etc.

Each student will be assigned a lab member for help with understanding the article and preparing the slides as well as the report.

Students should give a 35 minute presentation on their topic of choice and write a report (Seminararbeit) comprising 8 pages.

**Goals:** Participants are able to understand, critically assess, and compare current research papers in Bioinformatics. They are able to present algorithms and models from current research papers in oral and written form at a level that corresponds to that of scientific publications and conference presentations. Participants are able to suggest extension to current methods.

**Credits:** 3 ECTS

**Advanced Methods of Information Fusion**24344, SS 2020, 2 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)****Content**

The growing spread and performance of modern information and communication technologies produces an ever-increasing amount of data. It is one of the central challenges of our time to extract meaningful information from these data sets. The approach to address these issues, often called data science, combines strategies and methods from the fields of machine learning, mathematics, state estimation, visualization and pattern recognition. During this seminar, the students will familiarize themselves with concepts and methods particularly focusing on estimation theory and its application.

The seminar targets master students in computer science and bachelor students in Information engineering and management.

T

**6.264 Course: Seminar: Computer Science TECO [T-INFO-110808]**

**Responsible:** Prof. Dr.-Ing. Michael Beigl  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-105328 - Seminar: Computer Science TECO](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	2

T

**6.265 Course: Seminar: Governance, Risk & Compliance [T-INFO-102047]**

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101242 - Governance, Risk & Compliance](#)

Type	Credits	Version
Examination of another type	3	1

Events					
SS 2020	2400041	<a href="#">Governance, Risk &amp; Compliance</a>	2 SWS	Seminar (S)	Herzig
Exams					
SS 2020	7500140	<a href="#">Seminar: Legal Studies I</a>		Prüfung (PR)	Dreier, Boehm, Melullis, Matz

**6.266 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	Recurrence	Version
Examination of another type	3	Each term	1

Events					
WS 19/20	24389	<a href="#">IT-Sicherheit und Recht</a>	2 SWS	Seminar (S)	Schallbruch
SS 2020	2400041	<a href="#">Governance, Risk &amp; Compliance</a>	2 SWS	Seminar (S)	Herzig
SS 2020	2400061	<a href="#">Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung</a>	2 SWS	Seminar (S)	Bless, Boehm, Hartenstein, Madche, Sunyaev, Zitterbart
SS 2020	2400153	<a href="#">Online Manipulative Practices: New Technologies and Fundamental Rights Infringements</a>	2 SWS	Seminar (S)	Boehm
SS 2020	24820	<a href="#">Current Issues in Patent Law</a>	2 SWS	Seminar (S)	Melullis
Exams					
WS 19/20	7500035	<a href="#">Seminar: Legal Studies II</a>		Prüfung (PR)	Barczak
WS 19/20	7500182	<a href="#">Seminar: Legal Studies II</a>		Prüfung (PR)	Dreier, Boehm, Raabe
SS 2020	7500140	<a href="#">Seminar: Legal Studies I</a>		Prüfung (PR)	Dreier, Boehm, Melullis, Matz
SS 2020	7500159	<a href="#">Seminar: Legal Studies I</a>		Prüfung (PR)	Eichenhofer

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

**Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung**

2400061, SS 2020, 2 SWS, [Open in study portal](#)

Seminar (S)

**Content**

Registration via <https://portal.wiwi.kit.edu/ys/2708>

**Online Manipulative Practices: New Technologies and Fundamental Rights Infringements**

2400153, SS 2020, 2 SWS, [Open in study portal](#)

Seminar (S)

**Content**

New science-based technologies are fostering the process of making individuals more amenable to forms of manipulation online. The more technological capabilities improve, the more surveillance expands, the life of individuals becomes transparent, easier to predict and therefore easier to manipulate. More invasive practices lead to infringements of fundamental rights, which are not always easy to detect, as surveillance and manipulation techniques are getting more sophisticated and less obvious. After the now notorious Cambridge Analytica data scandal, we have now hard evidence individuals are exposed to manipulative practices online, which are most of the time difficult to detect as they operate silently and automatically. Manipulative practices aim at covertly subverting another person's capacity for conscious decision-making by exploiting in particular his/her cognitive, emotional, or other decision-making vulnerabilities. They involve influences that (1) are hidden, (2) exploit vulnerabilities, and (3) are targeted. The seminar has the objective to discuss a series of new technologies and techniques that are and can be used in online manipulative practices and analyse their legal and ethical implications. Special attention is dedicated to the risk such practices pose to fundamental rights such as the right to privacy, the right to the protection of personal data and the right to non-discrimination.

10 sub-topics are provided below. It is a list of new technologies and techniques that can be used in manipulative practices. Students should pick one sub-topic in order to write a short paper and prepare a presentation. Students work is guided through a series of questions and a list of recommended literature. In short, papers and presentations should be generally structured in this way:

- Describe the technology/techniques.
- Describe the legal and ethical implications stemming from the use and application of the selected technology/techniques. What fundamental rights are at stake?
- Focus on one legal aspect, for example the infringement of the right to privacy, (the sub-topic title and description and list of literature already guide the student in this sense), analyse the current legal framework concerning the protection of that right and describe the legal challenges that these new technologies and methods pose.

We also encourage students to investigate possible technical solutions to the problems highlighted in their analysis.



T

**6.267 Course: Service Analytics A [T-WIWI-105778]**

**Responsible:** Prof. Dr. Hansjörg Fromm  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101448 - Service Management](#)  
[M-WIWI-101470 - Data Science: Advanced CRM](#)  
[M-WIWI-101506 - Service Analytics](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	2

Events					
SS 2020	2595501	<a href="#">Service Analytics A</a>	3 SWS	Lecture (V)	Schmitz
Exams					
WS 19/20	7900086	<a href="#">Service Analytics A</a>		Prüfung (PR)	Fromm

**Competence Certificate**

Alternative exam assessment according to § 4 paragraph 2 Nr. 3 of the examination regulation.

**Prerequisites**

None

**Recommendation**

The lecture is addressed to students with interests and basic knowledge in the topics of Operations Research, descriptive and inductive statistics.

**Annotation**

This course is admission restricted.

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

V

**Service Analytics A**

2595501, SS 2020, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content****Learning objectives**

This course teaches students how to apply machine learning concepts to develop predictive models that form the basis of many innovative service offerings and business models today. Using a selected use case each term, students learn the foundations of selected algorithms and development frameworks and apply them to build a functioning prototype of an analytics-based service. Students will become proficient in writing code in Python to implement a data science use case over the course period.

**Description**

Data-driven services have become a key differentiator for many companies. Their development is based on the increasing availability of structured and unstructured data and their analysis through methods from data science and machine learning. Examples comprise highly innovative service offerings based on technologies such as natural language processing, computer vision or reinforcement learning.

Using a selected use case, this lecture will teach students how to develop analytics-based services in an applied setting. We teach the theoretical foundations of selected machine learning algorithms (e.g., convolutional neural networks) and development concepts (e.g., developing modeling, training, inference pipelines) and teach how to apply these concepts to build a functioning prototype of an analytics-based service (e.g., inference running on a device). During the course, students will work in small groups to apply the learned concepts in the programming language Python using packages such as Keras, Tensorflow or Scikit-Learn.

**Recommendations**

The course is aimed at students in the Master's program with basic knowledge in statistics and applied programming in Python. Knowledge from the lecture Artificial Intelligence in Service Systems may be beneficial.

**Additional information**

Due to the practical group sessions in the course, the number of participants is limited. Further information on the application process can be found on the course website ([https://dsi.iism.kit.edu/64\\_411.php](https://dsi.iism.kit.edu/64_411.php)).

Please apply via the WiWi Portal until April 17, 2020: <https://portal.wiwi.kit.edu/ys/3539>

**Literature**

- Friedman, Jerome, Trevor Hastie, and Robert Tibshirani. *The elements of statistical learning*. Vol. 1. No. 10. New York: Springer series in statistics, 2001.

T

**6.268 Course: Service Design Thinking [T-WIWI-102849]**

**Responsible:** Prof. Dr. Gerhard Satzger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101503 - Service Design Thinking](#)

Type	Credits	Recurrence	Version
Examination of another type	12	Irregular	4

**Competence Certificate**

Alternative exam assessment.

**Prerequisites**

None

**Recommendation**

This course is held in English – proficiency in writing and communication is required.

Our past students recommend to take this course at the beginning of the masters program.

**Annotation**

Due to practical project work as a component of the program, access is limited.

The module (as well as the module component) spans two semesters. It starts in September every year and runs until end of June in the subsequent year. Entering the program is only possible at its beginning - after prior application in May/June.

For more information on the application process and the program itself are provided in the module component description and the program's website (<http://sdt-karlsruhe.de>).

Furthermore, the KSRI conducts an information event for applicants every year in May.

This module is part of the KSRI Teaching Program „Digital Service Systems“. For more information see the KSRI Teaching website: [www.ksri.kit.edu/teaching](http://www.ksri.kit.edu/teaching).

T

**6.269 Course: Service Innovation [T-WIWI-102641]**

**Responsible:** Prof. Dr. Gerhard Satzger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101410 - Business & Service Engineering](#)  
[M-WIWI-101448 - Service Management](#)  
[M-WIWI-102806 - Service Innovation, Design & Engineering](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2595468	<a href="#">Service Innovation</a>	2 SWS	Lecture (V)	Satzger
Exams					
WS 19/20	7900252	<a href="#">Service Innovation</a>		Prüfung (PR)	Satzger

**Competence Certificate**

The assessment consists of a written exam (60 min.). A bonus can be acquired through successful participation in the exercise. If the grade of the written exam is between 4.0 and 1.3, the bonus improves the grade by one grade (0.3 or 0.4). Details will be announced in the lecture.

**Prerequisites**

None

**Recommendation**

None

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

V

**Service Innovation**2595468, SS 2020, 2 SWS, Language: English, [Open in study portal](#)**Lecture (V)****Content**

While innovation in manufacturing or agriculture can leverage a considerable body of research, experience and best practice, innovation in services has not reached the same level of maturity. In practice - while many organizations have a well-understood process for innovating in the product business - innovating in services is often still a fuzzy and complex undertaking.

In this lecture we will

- discuss the state of research
- compare product and service innovation
- understand how innovation diffusion works
- examine case studies of service innovation
- compare open vs. closed innovation
- learn how to leverage user communities to drive innovation and
- understand obstacles, and enablers and how to manage, incentivize and foster service innovation

**Literature**

- Cardoso, J., Fromm, H., Nickel, S., Satzger, G., Studer, R., & Weinhardt, C. (Eds.). (2015). Fundamentals of service systems (Vol. 12). Heidelberg: Springer.
- Lusch, R. F., & Nambisan, S. (2015). Service innovation: A service-dominant logic perspective. *MIS quarterly*, 39(1).
- Christensen, Clayton M. (2003). *The Innovator's Dilemma - when new technologies cause great firms to fail*. Boston, Massachusetts: Harvard Business Review Press.
- Rogers, S. (2003). *Diffusion of innovations*. 5. ed. New York: Free Press.
- Chesbrough, H. W. (2011). *Open services innovation - rethinking your business to grow and compete in a new era*. 1. ed. San Francisco: Jossey-Bass.
- Uebersnickel, F., Brenner, W., Pukall, B., Naef, T., & Schindlholzer, B. (2015). *Design Thinking: Das Handbuch*. Frankfurt am Main: Frankfurter Allgemeine Buch.
- Runco, M.A. (2014). *Creativity - Theories and Themes: Research, Development, and Practice*. 2. ed. Amsterdam: Academic Press

T

**6.270 Course: Signals and Codes [T-INFO-101360]**

**Responsible:** Prof. Dr. Jörn Müller-Quade  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101198 - Advanced Topics in Cryptography](#)

Type	Credits	Recurrence	Version
Oral examination	3	Irregular	1

Events					
WS 19/20	24137	<a href="#">Signals and Codes</a>	2 SWS	Lecture (V)	Geiselman, Müller-Quade
Exams					
WS 19/20	7500090	<a href="#">Signals and Codes</a>		Prüfung (PR)	Geiselman, Müller-Quade

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

V

**Signals and Codes**

24137, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)****Content**

In this lecture, bounds for codes (Hamming, Gilbert-Varshamov, Singleton) are presented. Coding and decoding for classical algebraic codes (linear, cyclic, Reed Solomon-, Goppa- und Reed Muller-codes) will be presented as well as concatenated codes.

**Literature**

Shu Lin, Daniel Costello, 'Error Control Coding', 2nd Ed., Pearson Prentice Hall, 2004  
 Todd Moon, 'Error Correction Coding', Wiley, 2005  
 Weitere Literatur wird in der Vorlesung bekannt gegeben.

**Weiterführende Literatur**

Wird in der Vorlesung bekannt gegeben.

T

**6.271 Course: Simulation Game in Energy Economics [T-WIWI-108016]**

**Responsible:** Dr. Massimo Genoese  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101451 - Energy Economics and Energy Markets](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each summer term	1

Events					
SS 2020	2581025	<a href="#">Simulation Game in Energy Economics</a>	3 SWS	Lecture / Practice (VÜ)	Genoese, Zimmermann

**Competence Certificate**

Examination as written assignment and oral presentation (§4 (2), 1 SPO).

**Prerequisites**

None

**Recommendation**

Visiting the course "Introduction to Energy Economics"

**Annotation**

See German version.

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

V

**Simulation Game in Energy Economics**

2581025, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

**Content**

- Introduction
- Agents and market places in the electricity industry
- Selected planning tasks of energy service companies
- Methods of modelling in the energy sector
- Agent-based simulation: The PowerACE model
- Simulation game: Simulation in energy economics (electricity and emission trading, investment decisions)

The lecture is structured in a theoretical and a practical part. In the theoretical part, the students are taught the basics to carry out simulations themselves in the practical part which comprises amongst others the simulation of the power exchange. The participants of the simulation game take a role as a power trader in the power market. Based on various sources of information (e.g. prognosis of power prices, available power plants, fuel prices), they can launch bids in the power exchange.

Assessment: presentation and written summary

Prerequisites: Basics in Energy economics ad markets are advantageous.

**Literature****Weiterführende Literatur:**

Möst, D. und Genoese, M. (2009): Market power in the German wholesale electricity market. The Journal of Energy Markets (47–74). Volume 2/Number 2, Summer 2009

T

**6.272 Course: Smart Energy Infrastructure [T-WIWI-107464]**

**Responsible:** Dr. Armin Ardone  
Dr. Dr. Andrej Marko Pustisek

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

**Part of:** [M-WIWI-101452 - Energy Economics and Technology](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2581023	<a href="#">(Smart) Energy Infrastructure</a>	2 SWS	Lecture (V)	Ardone, Pustisek, Jochem
Exams					
WS 19/20	7981023	<a href="#">Smart Energy Infrastructure</a>		Prüfung (PR)	Fichtner

**Competence Certificate**

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

**Prerequisites**

None.

**Annotation**

New course starting winter term 2017/2018.

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

V

**(Smart) Energy Infrastructure**

2581023, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

- Basic terms and concepts
- Meaning of infrastructure
- Excursus: regulation of infrastructure
- Natural gas transportation
- Natural gas storage
- Electricity transmission
- (Overview) Crude oil and oil product transportation



## T

## 6.273 Course: Smart Grid Applications [T-WIWI-107504]

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101446 - Market Engineering](#)  
[M-WIWI-103720 - eEnergy: Markets, Services and Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	2

Events					
WS 19/20	2540452	<a href="#">Smart Grid Applications</a>	2 SWS	Lecture (V)	Staudt, van Dinther
WS 19/20	2540453	<a href="#">Übung zu Smart Grid Applications</a>	1 SWS	Lecture (V)	Staudt, Golla
Exams					
WS 19/20	7900235	<a href="#">Smart Grid Applications</a>		Prüfung (PR)	Weinhardt
WS 19/20	7900308	<a href="#">Smart Grid Applications</a>		Prüfung (PR)	Weinhardt

**Competence Certificate**

The assessment consists of a written exam (60 min) (according to §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**

None

**Recommendation**

None

**Annotation**

The lecture will be read for the first time in winter term 2018/19.

## T

## 6.274 Course: Social Choice Theory [T-WIWI-102859]

**Responsible:** Prof. Dr. Clemens Puppe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101500 - Microeconomic Theory](#)  
[M-WIWI-101504 - Collective Decision Making](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2520537	<a href="#">Social Choice Theory</a>	2 SWS	Lecture (V)	Puppe
SS 2020	2520539	<a href="#">Übung zu Social Choice Theory</a>	1 SWS	Practice (Ü)	Puppe, Kretz

**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

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

## V

**Social Choice Theory**

2520537, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

Basisliteratur:

- Herve´ Moulin: Axioms of Cooperative Decision Making, Cambridge University Press, 1988
- Christian List and Clemens Puppe: Judgement Aggregation. A survey, in: Handbook of rational & social choice, P.Anand,P.Pattanaik, C.Puppe (Eds.), Oxford University Press 2009.

weiterführende Literatur:

- Amartya Sen: Collective Choice and Social Welfare, Holden-Day, 1970
- Wulf Gaertner: A Primer in Social Choice Theory, revised edition, Oxford University Press, 2009
- Wulf Gaertner: Domain Conditions in Social Choice Theory, Oxford University Press, 2001

## T

**6.275 Course: Sociotechnical Information Systems Development [T-WIWI-109249]**

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-104403 - Critical Digital Infrastructures](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each term	2

Events					
WS 19/20	2512400	<a href="#">Sociotechnical Information Systems Development</a>	3 SWS	Practical course (P)	Sunyaev, Sturm
SS 2020	2512400	<a href="#">Development of Sociotechnical Information Systems (Bachelor)</a>	3 SWS	Practical course (P)	Sunyaev, Sturm
SS 2020	2512401	<a href="#">Development of Sociotechnical Information Systems (Master)</a>	3 SWS	Practical course (P)	Sunyaev, Sturm
Exams					
WS 19/20	7900115	<a href="#">Development of Sociotechnical Information Systems</a>		Prüfung (PR)	Sunyaev
SS 2020	7900173	<a href="#">Development of Sociotechnical Information Systems (Master)</a>		Prüfung (PR)	Sunyaev

**Competence Certificate**

The alternative exam assessment consists of an implementation and a final thesis documenting the development and use of the application.

**Prerequisites**

None.

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

## V

**Sociotechnical Information Systems Development**

2512400, WS 19/20, 3 SWS, Language: German/English, [Open in study portal](#)

**Practical course (P)**

**Content**

The aim of this course is to provide a practical introduction into developing socio-technical information systems, such as web platforms, mobile apps, or desktop applications. Course participants will create (individually or in groups) software solutions for specific problems from various practical domains. The course tasks comprise requirements assessment, system design, and software implementation. Furthermore, course participants will gain insights into software quality assurance methods and software documentation.

**Learning objectives:**

- Independent and self-organized realization of a software development project
- Evaluation and selection of suitable development tools and methods
- Application of modern software development methods
- Planning and execution of different development tasks: requirements assessment, system design, implementation, and quality assurance
- Project documentation
- Presentation of project results in an comprehensible and structured form

## V

**Development of Sociotechnical Information Systems (Bachelor)**

2512400, SS 2020, 3 SWS, Language: German/English, [Open in study portal](#)

**Practical course (P)**

**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.

**Development of Sociotechnical Information Systems (Master)**

2512401, SS 2020, 3 SWS, Language: German/English, [Open in study portal](#)

**Practical course (P)****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.

T

**6.276 Course: Software Architecture and Quality [T-INFO-101381]**

**Responsible:** Prof. Dr. Ralf Reussner  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101201 - Software Systems](#)  
[M-INFO-101202 - Software Methods](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each summer term	1

Events					
SS 2020	24667	<a href="#">Software Architecture and Quality</a>	2 SWS	Lecture (V)	Reussner
Exams					
WS 19/20	7500032	<a href="#">Software Architecture and Quality</a>		Prüfung (PR)	Reussner
SS 2020	7500021	<a href="#">Software Architecture and Quality</a>		Prüfung (PR)	Reussner

## T

## 6.277 Course: Software Quality Management [T-WIWI-102895]

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101477 - Development of Business Information Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Events					
SS 2020	2511208	<a href="#">Software Quality Management</a>	2 SWS	Lecture (V)	Oberweis
SS 2020	2511209	<a href="#">Übungen zu Software-Qualitätsmanagement</a>	1 SWS	Practice (Ü)	Oberweis, Frister
Exams					
WS 19/20	7900027	<a href="#">Software Quality Management</a>		Prüfung (PR)	Oberweis
SS 2020	7900031	<a href="#">Software Quality Management (Registration until 13 July 2020)</a>		Prüfung (PR)	Oberweis

**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

**Software Quality Management**

2511208, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

This lecture imparts fundamentals of active software quality management (quality planning, quality testing, quality control, quality assurance) and illustrates them with concrete examples, as currently applied in industrial software development. Keywords of the lecture content are: software and software quality, process models, software process quality, ISO 9000-3, CMM(I), BOOTSTRAP, SPICE, software tests.

**Learning objectives:**

Students

- explain the relevant quality models,
- apply methods to evaluate the software quality and evaluate the results,
- know the mail models of software certification, compare and evaluate these models,
- write scientific theses in the area of software quality management and find own solutions for given problems.

**Recommendations:**

Programming knowledge in Java and basic knowledge of computer science are expected.

**Workload:**

- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h

### Literature

- Helmut Balzert: Lehrbuch der Software-Technik. Spektrum-Verlag 2008
- Peter Liggesmeyer: Software-Qualität, Testen, Analysieren und Verifizieren von Software. Spektrum Akademischer Verlag 2002
- Mauro Pezzè, Michal Young: Software testen und analysieren. Oldenbourg Verlag 2009

Weitere Literatur wird in der Vorlesung bekanntgegeben.

T

**6.278 Course: Software-Evolution [T-INFO-101256]**

**Responsible:** Prof. Dr. Ralf Reussner  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101201 - Software Systems](#)  
[M-INFO-101202 - Software Methods](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each winter term	1

Events					
WS 19/20	24164	<a href="#">Software Evolution</a>	2 SWS	Lecture (V)	Heinrich
Exams					
WS 19/20	7500004	<a href="#">Software-Evolution</a>		Prüfung (PR)	Reussner
SS 2020	7500023	<a href="#">Software-Evolution</a>		Prüfung (PR)	Reussner



## T

## 6.279 Course: Spatial Economics [T-WIWI-103107]

**Responsible:** Prof. Dr. Ingrid Ott

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

**Part of:** [M-WIWI-101485 - Transport Infrastructure Policy and Regional Development](#)  
[M-WIWI-101496 - Growth and Agglomeration](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2561260	<a href="#">Spatial Economics</a>	2 SWS	Lecture (V)	Ott
WS 19/20	2561261		1 SWS	Practice (Ü)	Ott, Bälz
Exams					
WS 19/20	7900075	<a href="#">Spatial Economics</a>		Prüfung (PR)	Ott

#### Competence Certificate

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

#### Prerequisites

None

#### Recommendation

Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses "Economics I" [2600012], and "Economics II" [2600014]. In addition, an interest in quantitative-mathematical modeling is required. The attendance of the course "Introduction to economic policy" [2560280] is recommended.

#### Annotation

Due to the research semester of Prof. Dr. Ingrid Ott, the course is not offered in the winter term 2018/19.

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

## V

## Spatial Economics

2561260, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

The course covers the following topics:

- Geography, trade and development
- Geography and economic theory
- Core models of economic geography and empirical evidence
- Agglomeration, home market effect, and spatial wages
- Applications and extensions

**Learning objectives:**

The student

- analyses how spatial distribution of economic activity is determined.
- uses quantitative methods within the context of economic models.
- has basic knowledge of formal-analytic methods.
- understands the link between economic theory and its empirical applications.
- understands to what extent concentration processes result from agglomeration and dispersion forces.
- is able to determine theory based policy recommendations.

**Recommendations:**

Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. An interest in mathematical modeling is advantageous.

**Workload:**

The total workload for this course is approximately 135 hours.

- Classes: ca. 30 h
- Self-study: ca. 45 h
- Exam and exam preparation: ca. 60 h

**Assessment:**

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

**Literature**

Steven Brakman, Harry Garretsen, Charles van Marrewijk (2009): The New Introduction to Geographical Economics, 2nd ed, Cambridge University Press.

Weitere Literatur wird in der Vorlesung bekanntgegeben.  
(Further literature will be announced in the lecture.)

## T

## 6.280 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-101410 - Business & Service Engineering](#)  
[M-WIWI-101506 - Service Analytics](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each term	2

Exams				
WS 19/20	7900263	<a href="#">Special Topics in Information Systems</a>	Prüfung (PR)	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 practical components and an active participation in class.

Please take into account that, beside the written documentation, also a practical component (such as a survey or an implementation of an application) is part of the course. Please examine the course description for the particular tasks.

The 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](http://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 Management and Engineering" so far. With this course students majoring in "Industrial Engineering and Management" and "Economics Engineering" also have the chance of getting practical experience and enhance their scientific capabilities.

The Special Topics Information Systems can be chosen instead of a regular lecture (see module description). Please take into account, that this course can only be accounted once per module.

T

## 6.281 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-101638 - Econometrics and Statistics I](#)  
[M-WIWI-101639 - Econometrics and Statistics II](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2521350	<a href="#">Statistical Modeling of Generalized Regression Models</a>	2 SWS	Lecture (V)	Heller
Exams					
WS 19/20	7900146	<a href="#">Statistical Modeling of generalized regression models</a>		Prüfung (PR)	Heller

### Competence Certificate

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation.

### Prerequisites

None

### Recommendation

Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics" [2520016]

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

V

## Statistical Modeling of Generalized Regression Models

2521350, WS 19/20, 2 SWS, [Open in study portal](#)

Lecture (V)

### Content

#### Learning objectives:

The student has profound knowledge of generalized regression models.

#### Requirements:

Knowledge of the contents covered by the course *Economics III: Introduction in Econometrics* [2520016].

#### Workload:

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

T

**6.282 Course: Stochastic Calculus and Finance [T-WIWI-103129]**

**Responsible:** Dr. Mher Safarian  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101639 - Econometrics and Statistics II](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2521331	<a href="#">Stochastic Calculus and Finance</a>	2 SWS	Lecture (V)	Safarian
Exams					
WS 19/20	7900225	<a href="#">Stochastic Calculus and Finance</a>		Prüfung (PR)	Safarian

**Competence Certificate**

The assessment of this course consists of a written examination (§4(2), 1 SPOs, 180 min.).

**Prerequisites**

None

**Annotation**

For more information see <http://statistik.econ.kit.edu/>

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

V

**Stochastic Calculus and Finance**

2521331, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content****Learning objectives:**

After successful completion of the course students will be familiar with many common methods of pricing and portfolio models in finance. Emphasis we put on both finance and the theory behind it.

**Content:**

The course will provide rigorous yet focused training in stochastic calculus and mathematical finance. Topics to be covered:

1. Stochastic Calculus: Stochastic Processes, Brownian Motion and Martingales, Entropy, Stopping Times, Local martingales, Doob-Meyer Decomposition, Quadratic Variation, Stochastic Integration, Ito Formula, Girsanov Theorem, Jump-diffusion Processes, Stable and Levy processes.
2. Mathematical Finance: Pricing Models, The Black-Scholes Model, State prices and Equivalent Martingale Measure, Complete Markets and Redundant Security Prices, Arbitrage Pricing with Dividends, Term-Structure Models (One Factor Models, Cox-Ingersoll-Ross Model, Affine Models), Term-Structure Derivatives and Hedging, Mortgage-Backed Securities, Derivative Assets (Forward Prices, Future Contracts, American Options, Look-back Options), Incomplete Markets, Markets with Transaction Costs, Optimal Portfolio and Consumption Choice (Stochastic Control and Merton continuous time optimization problem, CAPM), Equilibrium models, Numerical Methods.

**Workload:**

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

**Literature**

- Dynamic Asset Pricing Theory, Third Edition by D. Duffie, Princeton University Press, 1996
- Stochastic Calculus for Finance II: Continuous-Time Models by S. E. Shreve, Springer, 2003
- Stochastic Finance: An Introduction in Discrete Time by H. Föllmer, A. Schied, de Gruyter, 2011
- Methods of Mathematical Finance by I. Karatzas, S. E. Shreve, Springer, 1998
- Markets with Transaction Costs by Yu. Kabanov, M. Safarian, Springer, 2010
- Introduction to Stochastic Calculus Applied to Finance by D. Lamberton, B. Lapeyre, Chapman&Hall, 1996

T

## 6.283 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-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)

Type	Credits	Recurrence	Version
Written examination	1,5	Each winter term	1

Events					
WS 19/20	2530214	<a href="#">Strategic Finance and Technology Change</a>	1 SWS	Lecture (V)	N.N.
Exams					
WS 19/20	7900219	<a href="#">Strategic Finance and Technoloy Change</a>		Prüfung (PR)	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

## 6.284 Course: Strategic Management of Information Technology [T-WIWI-102669]

**Responsible:** Thomas Wolf  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101477 - Development of Business Information Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Exams				
WS 19/20	7900030	<a href="#">Strategic Management of Information Technology</a>	Prüfung (PR)	Wolf
SS 2020	7900034	<a href="#">Strategic Management of Information Technology (Registration until 13 July 2020)</a>	Prüfung (PR)	Wolf

**Competence Certificate**

Please note that the exam for first writers will be offered for the last time in winter semester 2019/2020. A last examination possibility exists in the summer semester 2020 (only for repeaters).

The assessment of this course is a written (60 min.) or (if necessary) oral examination according (30 min.) to §4(2) of the examination regulation.

**Prerequisites**

None



T

## 6.285 Course: Strategy and Management Theory: Developments and "Classics" [T-WIWI-106190]

**Responsible:** Prof. Dr. Hagen Lindstädt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103119 - Advanced Topics in Strategy and Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Irregular	1

Events					
WS 19/20	2577921	<a href="#">Strategy and Management Theory: Developments and "Classics" (Master)</a>	2 SWS	Seminar (S)	Lindstädt
SS 2020	2577921	<a href="#">Strategy and Management Theory: Developments and "Classics" (Master)</a>	2 SWS	Seminar (S)	Lindstädt
Exams					
WS 19/20	7900120	<a href="#">Strategy and Management Theory: Developments and "Classics"</a>		Prüfung (PR)	Lindstädt

### Competence Certificate

The control of success according to § 4(2), 3 SPO takes place by writing a scientific work and a presentation of the results of the work in the context of a conclusion meeting. Details on the design of the performance review will be announced during the lecture.

### Prerequisites

None

### Recommendation

Basic knowledge as conveyed in the bachelor module „Strategy and Organization“ is recommended.

### Annotation

This course is admission restricted. If you were already admitted to another course in the module “Advanced Topics in Strategy and Management” the participation at this course will be guaranteed.

The course is planned to be held for the first time in the winter term 2017/18.

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

V

### Strategy and Management Theory: Developments and "Classics" (Master)

2577921, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

In this lecture, students discuss and evaluate models in the field of strategic management with a focus on applicability and theory based limitations. Critical examination of current research results will be a substantial part of this course.

**Learning Objectives:**

Students

- are able to explain and evaluate theoretical approaches and models in the field of strategic management and can illustrate them by tangible examples
- learn to express their position in structured discussions

**Recommendations:**

Basic knowledge as conveyed in the bachelor module "Strategy and Organization" is recommended.

**Workload:**

The total workload for this course is approximately 90 hours.

Lecture: 15 hours

Preparation of lecture: 75 hours

Exam preparation: n/a

**Assessment:**

The control of success according to § 4(2), 3 SPO takes place by writing a scientific work and a presentation of the results of the work in the context of a final meeting. Details on the design of the success control will be announced during the lecture.

**Note:**

This course is admission restricted. If you were already admitted to another course in the module "Advanced Topics in Strategy and Management" the participation at this course will be guaranteed. Further information on the application process can be found on the IBU website.

The examinations are offered at least every second semester, so that the entire module can be completed in two semesters.



### Strategy and Management Theory: Developments and "Classics" (Master)

2577921, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

In this lecture, students discuss and evaluate models in the field of strategic management with a focus on applicability and theory based limitations. Critical examination of current research results will be a substantial part of this course.

**Learning Objectives:**

Students

- are able to explain and evaluate theoretical approaches and models in the field of strategic management and can illustrate them by tangible examples
- learn to express their position in structured discussions

**Recommendations:**

Basic knowledge as conveyed in the bachelor module "Strategy and Organization" is recommended.

**Workload:**

The total workload for this course is approximately 90 hours.

Lecture: 15 hours

Preparation of lecture: 75 hours

Exam preparation: n/a

**Assessment:**

The control of success according to § 4(2), 3 SPO takes place by writing a scientific work and a presentation of the results of the work in the context of a final meeting. Details on the design of the success control will be announced during the lecture.

**Note:**

This course is admission restricted. If you were already admitted to another course in the module "Advanced Topics in Strategy and Management" the participation at this course will be guaranteed. Further information on the application process can be found on the IBU website.

The examinations are offered at least every second semester, so that the entire module can be completed in two semesters.

T

**6.286 Course: Subdivision Algorithms [T-INFO-103550]**

**Responsible:** Prof. Dr. Hartmut Prautzsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101864 - Subdivision Algorithms](#)

Type	Credits	Recurrence	Version
Oral examination	5	Irregular	1

T

**6.287 Course: Supplement Enterprise Information Systems [T-WIWI-110346]**

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101477 - Development of Business Information Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each term	1

**Competence Certificate**

The assessment of this course is a written examination (60 min.) or (if necessary) oral examination (30 min.) according to §4(2) of the examination regulation.

**Prerequisites**

None

T

## 6.288 Course: Supply Chain Management in the Automotive Industry [T-WIWI-102828]

**Responsible:** Tilman Heupel  
Hendrik Lang

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

**Part of:** [M-WIWI-101412 - Industrial Production III](#)  
[M-WIWI-101471 - Industrial Production II](#)

Type	Credits	Recurrence	Version
Written examination	3,5	Each winter term	1

Events					
WS 19/20	2581957	<a href="#">Supply Chain Management in the automotive industry</a>	2 SWS	Lecture (V)	Lang, Heupel
Exams					
WS 19/20	7981957	<a href="#">Supply Chain Management in the Automotive Industry</a>		Prüfung (PR)	Schultmann

### Competence Certificate

The examination will be in form of a written exam acc. to §4(2), 1 ER. Exams are offered in every semester and can be re-examined at every ordinary examination date.

### Prerequisites

None

### Recommendation

None

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

V

## Supply Chain Management in the automotive industry

2581957, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

- Automotive industry significance
- The automotive supply chain
- Adding value structures of the automotive supply chain and mastering of the production systems as factors of success in the SCM
- Strategic procurement logistics
- Risk management
- Quality engineering and management in the automotive supply chain
- Cost engineering and management in the automotive supply chain
- Purchasing (Supplier selection, contract management)
- Performance measurement of the supply chain
- Organization

### Literature

Wird in der Veranstaltung bekannt gegeben.

T

## 6.289 Course: Supply Chain Management with Advanced Planning Systems [T-WIWI-102763]

**Responsible:** Claus J. Bosch  
Dr. Mathias Göbelt

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

**Part of:** [M-WIWI-101412 - Industrial Production III](#)  
[M-WIWI-101471 - Industrial Production II](#)

Type	Credits	Recurrence	Version
Written examination	3,5	Each summer term	1

Events					
SS 2020	2581961	<a href="#">Supply Chain Management with Advanced Planning Systems</a>	2 SWS	Lecture (V)	Göbelt, Bosch
Exams					
WS 19/20	7981961	<a href="#">Supply Chain Management with Advanced Planning Systems</a>		Prüfung (PR)	Schultmann

### Competence Certificate

The assessment consists of an oral (30 minutes) or a written (60 minutes) exam (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

None

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

V

## Supply Chain Management with Advanced Planning Systems

2581961, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

This lecture deals with supply chain management from a practitioner's perspective with a special emphasis Advanced Planning Systems (APS) and the planning domain. The software solution SAP SCM, one of the most widely used Advanced Planning Systems, is used as an example to show functionality and application of an APS in practice.

First, the term supply chain management is defined and its scope is determined. Methods to analyze supply chains as well as indicators to measure supply chains are derived. Second, the structure of an APS (advanced planning system) is discussed in a generic way. Later in the lecture, the software solution SAP SCM is mapped to this generic structure. The individual planning tasks and software modules (demand planning, supply network planning / sales & operations planning, production planning / detailed scheduling, deployment, transportation planning, global available-to-promise) are presented by discussing the relevant business processes, providing academic background, describing typical planning processes and showing the user interface and user-related processes in the software solution. At the end of the lecture, implementation methodologies and project management approaches for SAP SCM are covered.

**Contents****1. Introduction to Supply Chain Management**

- 1.1. Supply Chain Management Fundamentals
- 1.2. Supply Chain Management Analytics

**2. Structure of Advanced Planning Systems****3. SAP SCM**

- 3.1. Introduction / SCM Solution Map
- 3.2. Demand Planning
- 3.3. Supply Network Planning / Sales & Operations Planning
- 3.4. Production Planning and Detailed Scheduling
- 3.5. Deployment
- 3.6. Transportation Planning / Global Available to Promise
- 3.7. Cloud-based Supply Chain Planning

**4. SAP SCM in Practice**

- 4.1. Project Management and Implementation
- 4.2. SAP Implementation Methodology

**Literature**

will be announced in the course

T

**6.290 Course: Symmetric Encryption [T-INFO-101390]**

**Responsible:** Prof. Dr. Jörn Müller-Quade  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101198 - Advanced Topics in Cryptography](#)  
[M-INFO-101207 - Networking Security - Theory and Praxis](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each summer term	1

Events					
SS 2020	24629	<a href="#">Symmetric encryption</a>	2 SWS	Lecture (V)	Müller-Quade, Geiselmann
Exams					
WS 19/20	7500178	<a href="#">Symmetric Encryption</a>		Prüfung (PR)	Geiselmann, Müller-Quade

**Competence Certificate**

Es wird empfohlen, das Modul Sicherheit zu belegen.

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

V

**Symmetric encryption**

24629, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)



T

## 6.291 Course: Tax Law I [T-INFO-101315]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101216 - Private Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	24168	<a href="#">Tax Law I</a>	2 SWS	Lecture (V)	Dietrich
Exams					
WS 19/20	7500066	<a href="#">Tax Law I</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500052	<a href="#">Tax Law I</a>		Prüfung (PR)	Dreier, Matz

T

## 6.292 Course: Tax Law II [T-INFO-101314]

**Responsible:** Detlef Dietrich  
Prof. Dr. Thomas Dreier

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101216 - Private Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	24646	<a href="#">Tax Law II</a>	2 SWS	Lecture (V)	Dietrich
Exams					
WS 19/20	7500067	<a href="#">Tax Law II</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500053	<a href="#">Tax Law II</a>		Prüfung (PR)	Dreier, Matz

T

**6.293 Course: Technologies for Innovation Management [T-WIWI-102854]**

**Responsible:** Dr. Daniel Jeffrey Koch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101507 - Innovation Management](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each winter term	2

Events					
WS 19/20	2545106	<a href="#">Technologies for Innovation Management</a>	2 SWS	Block (B)	Koch
Exams					
WS 19/20	7900239	<a href="#">Technologies for Innovation Management</a>		Prüfung (PR)	Weissenberger-Eibl

**Competence Certificate**

Presentation and individual paper (ca. 15 pages) as alternative exam assessment.

**Prerequisites**

None

**Recommendation**

Prior attendance of the course Innovationsmanagement: Konzepte, Strategien und Methoden is recommended.

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

V

**Technologies for Innovation Management**

2545106, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

**Block (B)****Content**

The seminar "Technologies for Innovation Management" will focus on the early phase or fuzzy front end in innovation management. Technologies can be of great importance here, above all in the supply of information. In globally distributed R & D organizations, it is necessary to collect as much information as possible on new technological developments in the early phase of the innovation process. Information and communication technologies can be supported.

**Literature**

Werden in der ersten Veranstaltung bekannt gegeben.

T

**6.294 Course: Technology Assessment [T-WIWI-102858]**

**Responsible:** Dr. Daniel Jeffrey Koch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101507 - Innovation Management](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	see Annotations	1

Exams				
SS 2020	7900238	<a href="#">Technology Assessment</a>	Prüfung (PR)	Weissenberger-Eibl

**Competence Certificate**

Alternative exam assessment.

**Prerequisites**

None

**Recommendation**

Prior attendance of the course Innovation Management is recommended.

**Annotation**

See German version.

T

**6.295 Course: Telecommunication and Internet Economics [T-WIWI-102713]**

**Responsible:** Prof. Dr. Kay Mitusch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101406 - Network Economics](#)  
[M-WIWI-101409 - Electronic Markets](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2561232	<a href="#">Telecommunication and Internet Economics</a>	2 SWS	Lecture (V)	Mitusch
WS 19/20	2561233	<a href="#">Übung zu Telekommunikations- und Internetökonomie</a>	1 SWS	Practice (Ü)	Mitusch, Wisotzky
Exams					
WS 19/20	7900296	<a href="#">Telecommunication and Internet Economics</a>		Prüfung (PR)	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**

Basic knowledge and skills of microeconomics from undergraduate studies (bachelor's degree) are expected.

Particularly helpful but not necessary: Industrial Economics. Prior attendance of the lecture „Competition in Networks“ [26240] or "Industrial Organisation" is helpful in any case but not considered a formal precondition. The english taught course "Communications Economics" is complementary and recommendet for anyone interested in the sector.

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

V

**Telecommunication and Internet Economics**

2561232, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

J.-J. Laffont, J. Tirole (2000): Competition in Telecommunications, MIT Press.

Zarnekow, Wulf, Bronstaedt (2013): Internetwirtschaft: Das Geschäft des Datentransports im Internet.

Weitere Literatur wird in den einzelnen Veranstaltungen angegeben

T

**6.296 Course: Telecommunications Law [T-INFO-101309]**

**Responsible:** Prof. Dr. Nikolaus Marsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101217 - Public Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	24632	<a href="#">Telekommunikationsrecht</a>	2 SWS	Lecture (V)	Hermstrüwer
Exams					
WS 19/20	7500049	<a href="#">Telecommunications Law</a>		Prüfung (PR)	Barczak
SS 2020	7500085	<a href="#">Telecommunications Law</a>		Prüfung (PR)	Eichenhofer

T

**6.297 Course: Telematics [T-INFO-101338]**

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100801 - Telematics](#)  
[M-INFO-101205 - Future Networking](#)  
[M-INFO-101206 - Networking](#)

Type	Credits	Recurrence	Version
Written examination	6	Each winter term	1

Events					
WS 19/20	24128	<a href="#">Telematics</a>	3 SWS	Lecture (V)	Bauer, Friebe, Heseding, Hock, Zitterbart
Exams					
WS 19/20	7500166	<a href="#">Telematics</a>		Prüfung (PR)	Zitterbart

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

V

**Telematics**

24128, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

### Content

The lecture covers (i.a.) protocols, architectures, as well as methods and algorithms, for routing and establishing reliable end-to-end connections in the Internet. In addition to various methods for media access control in local area networks, the lecture also covers other communication systems, e.g. circuit-switched systems such as ISDN. Participants should also have understood the possibilities for managing and administering networks.

Familiarity with the contents of the lecture *Einführung in Rechnernetze* or comparable lectures is assumed.

### Learning Objectives

After attending this lecture, the students will

- have a profound understanding of protocols, architectures, as well as procedures and algorithms used for routing and for establishing reliable end-to-end connections in the Internet
- have a profound understanding of different media access control procedures in local networks and other communication systems like circuit-switched ISDN
- have a profound understanding of the problems that arise in large scale dynamic communication systems and are familiar with mechanism to deal with these problems
- be familiar with current developments such as SDN and data center networking
- be familiar with different aspects and possibilities for network management and administration

Students have a profound understanding of the basic protocol mechanisms that are necessary to establish reliable end-to-end communication. Students have detailed knowledge about the congestion and flow control mechanisms used in TCP and can discuss fairness issue in the context of multiple parallel transport streams. Students can analytically determine the performance of transport protocols and know techniques for dealing with specific constraints in the context of TCP, e.g., high data rates and low latencies. Students are familiar with current topics such as the problem of middle boxes on the Internet, the usage of TCP in data centers or multipath TCP. Students are also familiar with practical aspects of modern transport protocols and know practical ways to overcome heterogeneity in the development of distributed applications.

Students know the functions of (Internet) routing and routers and can explain and apply common routing algorithms. Students are familiar with routing architectures and different alternatives for buffer placement as well as their advantages and disadvantages. Students understand the classification into interior and exterior gateway protocols and have in-depth knowledge of the functionality and features of common protocols such as RIP, OSPF, and BGP. Students are also familiar with current topics such as label switching, IPv6 and SDN.

Students know the function of media access control and are able to classify and analytically evaluate different media access control mechanisms. Students have an in-depth knowledge of Ethernet and various Ethernet variants and characteristics, which especially includes current developments such as real-time Ethernet and data center Ethernet. Students can explain and apply the Spanning Tree Protocol.

Students know the architecture of ISDN and can reproduce the peculiarities of setting up the ISDN subscriber line. Students are familiar with the technical features of DSL.

### Literature

S. Keshav. An Engineering Approach to Computer Networking. Addison-Wesley, 1997  
 J.F. Kurose, K.W. Ross. Computer Networking: A Top-Down Approach Featuring the Internet. 4rd Edition, Addison-Wesley, 2007  
 W. Stallings. Data and Computer Communications. 8th Edition, Prentice Hall, 2006  
 Weiterführende Literatur •D. Bertsekas, R. Gallager. Data Networks. 2nd Edition, Prentice-Hall, 1991  
 •F. Halsall. Data Communications, Computer Networks and Open Systems. 4th Edition, Addison-Wesley Publishing Company, 1996  
 •W. Haaß. Handbuch der Kommunikationsnetze. Springer, 1997  
 •A.S. Tanenbaum. Computer-Networks. 4th Edition, Prentice-Hall, 2004  
 •Internet-Standards  
 •Artikel in Fachzeitschriften



T

**6.298 Course: The negotiation of open innovation [T-WIWI-110867]**

**Responsible:** Dr. Daniela Beyer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101507 - Innovation Management](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Once	1

Events					
SS 2020	2545105	<a href="#">Negotiating Open Innovation</a>	2 SWS	Seminar (S)	Beyer
Exams					
SS 2020	7900017	<a href="#">Die Aushandlung von Open Innovation</a>		Prüfung (PR)	Weissenberger-Eibl

**Competence Certificate**

Non exam assessment.

The following aspects are included in the evaluation:

- Exposé of the seminar paper (15%)
- Preparation of the methodology (15%) (interview guide, quantitative survey, etc.)
- informed participation and preparation of the simulation game (20%)
- written elaboration (50%).

**Prerequisites**

None

**Recommendation**

Prior attendance of the course Innovation Management [2545015] is recommended.

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

V

**Negotiating Open Innovation**

2545105, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)****Content**

In times of great challenges, it is no longer sufficient for individual experts to be responsible for innovation success. This is precisely why there is currently so much hype surrounding the topic of Open Innovation. The exchange of knowledge within and between organizations is crucial, but requires the right attitudes and decisions. This seminar examines how this can be achieved in the best possible way, depending on the objectives. By visiting two practitioners from science-economics cooperations and the company's own Startup Accelerator Programme, theory and practice are linked. Furthermore, a simulation game will take place in the last session, in which the learned will be applied. The grading is based on a group seminar work, which requires an empirical analysis and the preparation of this in the course of the semester (expose, preparation of the methodology) as well as well-informed participation.

T

**6.299 Course: Theory of Endogenous Growth [T-WIWI-102785]**

**Responsible:** Prof. Dr. Ingrid Ott  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101478 - Innovation and Growth](#)  
[M-WIWI-101496 - Growth and Agglomeration](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2561503	<a href="#">Theory of endogenous growth</a>	2 SWS	Lecture (V)	Ott
WS 19/20	2561504		1 SWS	Practice (Ü)	Ott, Eraydin

**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. Re-examinations are offered at every ordinary examination date.

Students will be given the opportunity of writing and presenting a short paper during the lecture time to achieve a bonus on the exam grade. If the mandatory credit point exam is passed, the awarded bonus points will be added to the regular exam points. A deterioration is not possible by definition, and a grade does not necessarily improve, but is very likely to (not every additional point improves the total number of points, since a grade can not become better than 1). The voluntary elaboration of such a paper can not countervail a fail in the exam.

**Prerequisites**

None

**Recommendation**

Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required.

**Annotation**

Due to the research semester of Prof. Dr. Ingrid Ott, the course is not offered in the winter term 2018/19.

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

V

**Theory of endogenous growth**

2561503, WS 19/20, 2 SWS, Language: German/English, [Open in study portal](#)

Lecture (V)

**Content**

This course is intended as an introduction to the field of advanced macroeconomics with a special focus on economic growth. Lectures aim to deal with the theoretical foundations of exogenous and endogenous growth models. The importance of growth for nations and discussion of some (well-known) growth theories together with the role of innovation, human capital and environment will therefore be primary focuses of this course.

**Learning objective:**

Students shall be given the ability to understand, analyze and evaluate selected models of endogenous growth theory.

**Course content:**

- Intertemporal consumption decision
- Growth models with exogenous saving rates: Solow
- Growth models with endogenous saving rates: Ramsey
- Growth and environmental resources
- Basic models of endogenous growth
- Human capital and economic growth
- Modelling of technological progress
- Diversity Models
- Schumpeterian growth
- Directional technological progress
- Diffusion of technologies

**Recommendations:**

Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required.

**Workload:**

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

**Exam description:**

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. Re-examinations are offered at every ordinary examination date.

Students will be given the opportunity of writing and presenting a short paper during the lecture time to achieve a bonus on the exam grade. If the mandatory credit point exam is passed, the awarded bonus points will be added to the regular exam points. A deterioration is not possible by definition, and a grade does not necessarily improve, but is very likely to (not every additional point improves the total number of points, since a grade can not become better than 1). The voluntary elaboration of such a paper can not countervail a fail in the exam.

**Literature**

Auszug:

- Acemoglu, D. (2009): Introduction to modern economic growth. Princeton University Press, New Jersey.
- Aghion, P., Howitt, P. (2009): Economics of growth, MIT-Press, Cambridge/MA.
- Barro, R.J., Sala-i-Martin, X. (2003): Economic Growth. MIT-Press, Cambridge/MA.
- Sydsaeter, K., Hammond, P. (2008): Essential mathematics for economic analysis. Prentice Hall International, Harlow.
- Sydsæter, K., Hammond, P., Seierstad, A., Strom, A., (2008): Further Mathematics for Economic Analysis, Second Edition, Pearson Education Limited, Essex.

T

**6.300 Course: Topics in Experimental Economics [T-WIWI-102863]**

**Responsible:** Prof. Dr. Johannes Philipp Reiß  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101505 - Experimental Economics](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Events					
SS 2020	2560232	<a href="#">Topics in Experimental Economics</a>	2 SWS	Lecture (V)	Reiß
SS 2020	25602333	<a href="#">Übungen zu Topics in Experimental Economics</a>	1 SWS	Practice (Ü)	Reiß
Exams					
WS 19/20	7900221	<a href="#">Topics in Experimental Economics</a>		Prüfung (PR)	Reiß

**Competence Certificate**

The assessment consists of a written exam (following §4(2), 1 of the examination regulation).

**Prerequisites**

None

**Recommendation**

Basic knowledge of Experimental Economics is assumed. Therefore, it is strongly recommended to attend the course Experimental Economics beforehand.

**Annotation**

The course is offered in summer 2020 for the next time, not in summer 2018.

T

**6.301 Course: Trademark and Unfair Competition Law [T-INFO-101313]**

**Responsible:** Dr. Yvonne Matz  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101215 - Intellectual Property Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
WS 19/20	24136	<a href="#">Trademark and Unfair Competition Law</a>	2 SWS	Lecture (V)	Matz
Exams					
WS 19/20	7500061	<a href="#">Trademark and Unfair Competition Law</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500051	<a href="#">Trademark and Unfair Competition Law</a>		Prüfung (PR)	Dreier, Matz

T

**6.302 Course: Transport Economics [T-WIWI-100007]**

**Responsible:** Prof. Dr. Kay Mitusch  
Dr. Eckhard Szimba

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

**Part of:** [M-WIWI-101406 - Network Economics](#)  
[M-WIWI-101468 - Environmental Economics](#)  
[M-WIWI-101485 - Transport Infrastructure Policy and Regional Development](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2020	2560230	<a href="#">Transport Economics</a>	SWS	Lecture (V)	Mitusch, Szimba
SS 2020	2560231	<a href="#">Übung zu Transportökonomie</a>	SWS	Practice (Ü)	Mitusch, Szimba, Wisotzky
Exams					
WS 19/20	7900293	<a href="#">Transport Economics</a>		Prüfung (PR)	Mitusch

**Competence Certificate**

The assessment 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.

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

V

**Transport Economics**

2560230, SS 2020, SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature****Literatur:**

Aberle, G: Transportwirtschaft: einzelwirtschaftliche und gesamtwirtschaftliche Grundlagen München; Wien: Oldenbourg, 2003.

Blauwens, G., De Baere, P. and Van der Voorde, E. (2006): Transport Economics.

Frerich, J; Müller, G: Europäische Verkehrspolitik, Landverkehrspolitik München; Wien: Oldenbourg, 2004.

Dasgupta, A, Pearce, D (1972): Cost-Benefit Analysis, MacMillan, London.

Europäische Kommission (2008): Guide to Cost Benefit Analysis of Investment Projects, online unter [Ortúzar, J. d. D. and Willumsen, L. \(1990\): Modelling Transport.](http://ec.europa.eu/regional_policy/sources/Ben-Akiva, M., Meerseman, H., and Van de Voorde, E. (2008): Recent developments in transport modelling: Lessons for the freight sector.</a></p>
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## T

## 6.303 Course: Ubiquitous Computing [T-INFO-101326]

**Responsible:** Prof. Dr.-Ing. Michael Beigl  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100789 - Ubiquitous Computing](#)  
[M-INFO-101203 - Wireless Networking](#)  
[M-INFO-101210 - Dynamic IT-Infrastructures](#)  
[M-WIWI-101458 - Ubiquitous Computing](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each winter term	1

Events					
WS 19/20	24146	<a href="#">Ubiquitäre Informationstechnologien</a>	2+1 SWS	Lecture / Practice (VÜ)	Beigl
Exams					
WS 19/20	7500124_03-03-20	<a href="#">Ubiquitous Computing</a>		Prüfung (PR)	Beigl
WS 19/20	7500124_05-05-20	<a href="#">Ubiquitous Computing</a>		Prüfung (PR)	Beigl
WS 19/20	7500124_09-04-20	<a href="#">Ubiquitous Computing</a>		Prüfung (PR)	Beigl
WS 19/20	7500124_110220	<a href="#">Ubiquitous Computing</a>		Prüfung (PR)	Beigl
SS 2020	7500122	<a href="#">Ubiquitous Computing</a>		Prüfung (PR)	Beigl

## T

## 6.304 Course: Valuation [T-WIWI-102621]

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101482 - Finance 1](#)  
[M-WIWI-101483 - Finance 2](#)  
[M-WIWI-101510 - Cross-Functional Management Accounting](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2530212	<a href="#">Valuation</a>	2 SWS	Lecture (V)	Ruckes
WS 19/20	2530213	<a href="#">Übungen zu Valuation</a>	1 SWS	Practice (Ü)	Ruckes, Stengel
Exams					
WS 19/20	7900057	<a href="#">Valuation</a>		Prüfung (PR)	Ruckes

**Competence Certificate**  
See German version.

**Prerequisites**  
None

**Recommendation**  
None

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

## V

## Valuation

2530212, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

## Literature

## Weiterführende Literatur

Titman/Martin (2013): *Valuation - The Art and Science of Corporate Investment Decisions*, 2nd. ed. Pearson International.



## T

## 6.305 Course: Wearable Robotic Technologies [T-INFO-106557]

**Responsible:** Prof. Dr.-Ing. Tamim Asfour  
Prof. Dr.-Ing. Michael Beigl

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-103294 - Wearable Robotic Technologies](#)

Type	Credits	Recurrence	Version
Written examination	4	Each summer term	3

Events					
SS 2020	2400062	<a href="#">Wearable Robotic Technologies</a>	2 SWS	Lecture (V)	Asfour, Beigl, Beil, Starke
Exams					
WS 19/20	7500073	<a href="#">Wearable Robotic Technologies</a>		Prüfung (PR)	Asfour
SS 2020	7500219	<a href="#">Wearable Robotic Technologies</a>		Prüfung (PR)	Asfour

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

## V

## Wearable Robotic Technologies

2400062, SS 2020, 2 SWS, Language: German/English, [Open in study portal](#)

Lecture (V)

### Content

The lecture starts with an overview of wearable robot technologies (exoskeletons, prostheses and orthoses) and its potentials, followed by the basics of wearable robotics. In addition to different approaches to the design of wearable robots and their related actuator and sensor technology, the lecture focuses on modeling the neuromusculoskeletal system of the human body and the physical and cognitive human-robot interaction for tightly coupled hybrid human-robot systems. Examples of current research and various applications of lower, upper and full body exoskeletons as well as prostheses are presented.

### Learning Objectives:

The students have received fundamental knowledge about wearable robotic technologies and understand the requirements for the design, the interface to the human body and the control of wearable robots. They are able to describe methods for modelling the human neuromusculoskeletal system, the mechatronic design, fabrication and composition of interfaces to the human body. The students understand the symbiotic human-machine interaction as a core topic of Anthropomatics and have knowledge of state of the art examples of exoskeletons, orthoses and prostheses.

### Literature

Vorlesungsfolien und ausgewählte aktuelle Literaturangaben werden in der Vorlesung bekannt gegeben und als pdf unter <http://www.humanoids.kit.edu> verfügbar gemacht.

T

**6.306 Course: Web Applications and Service-Oriented Architectures (II) [T-INFO-101271]**

**Responsible:** Prof. Dr. Sebastian Abeck  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-104061 - Microservice-Based Web Applications](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2020	24677	<a href="#">Web Applications and Service oriented Architectures (II)</a>	2 SWS	Lecture (V)	Abeck, Schneider

T

**6.307 Course: Web Science [T-WIWI-103112]**

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101455 - Web Data Management](#)  
[M-WIWI-105368 - Web and Data Science](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	2

Events					
WS 19/20	2511312	<a href="#">Web Science</a>	2 SWS	Lecture (V)	Sure-Vetter
WS 19/20	2511313	<a href="#">Exercises to Web Science</a>	1 SWS	Practice (Ü)	Sure-Vetter, Heling
Exams					
WS 19/20	7900031	<a href="#">Web Science</a>		Prüfung (PR)	Sure-Vetter
SS 2020	7900032	<a href="#">Web Science (Registration until 13 July 2020)</a>		Prüfung (PR)	Sure-Vetter

**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 (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

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

V

**Web Science**

2511312, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

The lecture provides insights into the analysis of social networks and the used metrics. Thereby, in particular, web phenomena and the available technologies are considered.

Web Science is the emergent study of the people and technologies, applications, processes and practices that shape and are shaped by the World Wide Web. Web Science aims to draw together theories, methods and findings from across academic disciplines, and to collaborate with industry, business, government and civil society, to develop our knowledge and understanding of the Web: the largest socio-technical infrastructure in human history.

The lecture provides an introduction to basic concepts of Web Science. Essential theoretical foundations, phenomena and approaches are presented and explained.

This course aims to provide students with a basic knowledge and understanding about the structure and analysis of selected web phenomena and technologies. Topics include the small world problem, network theory, social network analysis, graph search and technologies/standards/architectures.

**Learning objectives:**

The students

- look critically into current research topics in the field of Web Science and learns in particular about the topics small-world-problem, network theory, social network analysis, bibliometrics, as well as link analysis and search.
- apply interdisciplinary thinking.
- train the application of technological approaches to social science problems.

**Workload:**

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

**Literature**

- Networks, Crowds, and Markets: Reasoning About a Highly Connected World, by David Easley and Jon Kleinberg, 2010 (free online book: <http://www.cs.cornell.edu/home/kleinber/networks-book/>)
- Thelwall, M. (2009). Social network sites: Users and uses. In: M. Zelkowitz (Ed.), Advances in Computers 76. Amsterdam: Elsevier (pp. 19-73)

**Exercises to Web Science**

2511313, WS 19/20, 1 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

**Content**

The exercises are related to the lecture Web Science.

Multiple exercises are held that capture the topics, held in the lecture Web Science and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

This course aims to provide students with a basic knowledge and understanding about the structure and analysis of selected web phenomena and technologies. Topics include the small world problem, network theory, social network analysis, graph search and technologies/standards/architectures.

**Learning objectives:**

The students

- look critically into current research topics in the field of Web Science and learns in particular about the topics small-world-problem, network theory, social network analysis, bibliometrics, as well as link analysis and search.
- apply interdisciplinary thinking.
- train the application of technological approaches to social science problems.

**Literature**

- Networks, Crowds, and Markets: Reasoning About a Highly Connected World, by David Easley and Jon Kleinberg, 2010 (free online book: <http://www.cs.cornell.edu/home/kleinber/networks-book/>)
- Thelwall, M. (2009). Social network sites: Users and uses. In: M. Zelkowitz (Ed.), Advances in Computers 76. Amsterdam: Elsevier (pp. 19-73)

T

## 6.308 Course: Workshop Business Wargaming – Analyzing Strategic Interactions [T-WIWI-106189]

**Responsible:** Prof. Dr. Hagen Lindstädt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103119 - Advanced Topics in Strategy and Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Irregular	1

Events					
WS 19/20	2577922	<a href="#">Workshop Business Wargaming - Analyse strategischer Interaktionen (Master)</a>	2 SWS	Seminar (S)	Lindstädt
Exams					
WS 19/20	7900172	<a href="#">Workshop Business Wargaming – Analyzing Strategic Interactions</a>		Prüfung (PR)	Lindstädt

### Competence Certificate

In this course, real conflict situations are simulated and analyzed using various methods from business wargaming. Details on the design of the performance review will be announced during the lecture.

### Prerequisites

None

### Recommendation

Basic knowledge as conveyed in the bachelor module „Strategy and Organization“ is recommended.

### Annotation

This course is admission restricted. If you were already admitted to another course in the module “Advanced Topics in Strategy and Management” the participation at this course will be guaranteed.

The course is planned to be held for the first time in the summer term 2018.

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

V

### Workshop Business Wargaming - Analyse strategischer Interaktionen (Master)

2577922, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

In this lecture, current economic trends will be discussed from a perspective of competition analysis and corporate strategies. Using appropriate frameworks, the students will be able to analyze collectively selected case studies and derive business strategies.

**Learning Objectives:**

Students

- are able to analyze business strategies and derive recommendations for the management
- learn to express their position through compelling reasoning in structured discussions

**Recommendations:**

Basic knowledge as conveyed in the bachelor module "Strategy and Organization" is recommended.

**Workload:**

The total workload for this course is approximately 90 hours.

Lecture: 15 hours

Preparation of lecture: 75 hours

Exam preparation: n/a

**Assessment:**

In this course, real conflict situations are simulated and analyzed using various methods from business wargaming. Details on the design of the success control will be announced during the lecture.

**Note:**

This course is admission restricted. If you were already admitted to another course in the module "Advanced Topics in Strategy and Management" the participation at this course will be guaranteed. Further information on the application process can be found on the IBU website.

The examinations are offered at least every second semester, so that the entire module can be completed in two semesters.

T

## 6.309 Course: Workshop Current Topics in Strategy and Management [T-WIWI-106188]

**Responsible:** Prof. Dr. Hagen Lindstädt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-103119 - Advanced Topics in Strategy and Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Irregular	1

Events					
SS 2020	2577923	<a href="#">Workshop aktuelle Themen Strategie und Management (Master)</a>	2 SWS	Seminar (S)	Lindstädt

### Competence Certificate

The evaluation of the performance takes place through the active participation in the discussion rounds; an appropriate preparation is expressed here and a clear understanding of the topic and framework becomes recognizable. Further details on the design of the performance review will be announced during the lecture.

### Prerequisites

None

### Recommendation

Basic knowledge as conveyed in the bachelor module „Strategy and Organization“ is recommended.

### Annotation

This course is admission restricted. If you were already admitted to another course in the module “Advanced Topics in Strategy and Management” the participation at this course will be guaranteed.

The course is planned to be held for the first time in the winter term 2017/18.

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

V

### Workshop aktuelle Themen Strategie und Management (Master)

2577923, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

In this lecture, students discuss and evaluate models in the field of strategic management with a focus on applicability and theory based limitations. Critical examination of current research results will be a substantial part of this course.

**Learning Objectives:**

Students

- are able to explain and evaluate theoretical approaches and models in the field of strategic management and can illustrate them by tangible examples
- learn to express their position in structured discussions

**Recommendations:**

Basic knowledge as conveyed in the bachelor module "Strategy and Organization" is recommended.

**Workload:**

The total workload for this course is approximately 90 hours.

Lecture: 15 hours

Preparation of lecture: 75 hours

Exam preparation: n/a

**Assessment:**

The assessment of performance is made through active participation in the discussion rounds; adequate preparation is expressed here and a clear understanding of the topic and framework becomes evident. Further details on the design of the success control will be announced during the lecture.

**Note:**

This course is admission restricted. If you were already admitted to another course in the module "Advanced Topics in Strategy and Management" the participation at this course will be guaranteed. Further information on the application process can be found on the IBU website.

The examinations are offered at least every second semester, so that the entire module can be completed in two semesters.